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THE AUTOMOBILE

WEEKLY NEW YORK—SATURDAY, JANUARY 2, 1904—CHICAGO 10 CENTS

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PACKARD MOTOR CAR COMPANY

DEPT. 2. DETROIT, MICH., U.S.A.

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THE RUSH FOR 1904 KNOX CARS

NEW YORK SHOW,
Spaces 61, 62 and 63.
CHICAGO SHOW,
Spaces 9, 10, 11 and 12.

Nearly our whole output for 1903 was sold between January 1st and February 15th and many who neglected to place their orders before January 1st lost their chance. We are already shipping 1904 machines. All who have seen and tried them are convinced that they are far in advance of anything produced heretofore and the rush to place orders has begun so early as to indicate that by the time of the New York Show our output for practically every desirable delivery date will be taken.

The 1904 Knox Line is the Greatest Line ever offered to Agents. Have you placed YOUR order?

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WEEKLY NEW YORK—SATURDAY, JANUARY 2, 1904—CHICAGO 10 CENTS

Road Posting and Inspection

SYSTEMATIC work has been entered upon by the Rhode Island Automobile Club, having headquarters in Providence, to remove one of the chief causes of annoyance in touring. The uncertainty that constantly harasses the mind of the road user as to the right road to follow to reach a given place, the exact distance to the next town, the character of the road surface, the safety or danger of a hill that winds out of sight at the bottom, the presence of railroad crossings, condemned bridges, washouts and other dangers frequently encountered at unexpected places on unfamiliar roads and the helpless feeling that surges over one, sometimes, in case the most trifling repair is required and there is no means of knowing where to find the nearest repair shop and supply station—the substitute for the old-time blacksmith shop—these are to be changed to complacent enjoyment of the scenery, the unalloyed charm of exhilarating motion and the constant satisfaction of definite knowledge at all times on the points mentioned, by the erection of guide boards and sign posts at frequent intervals along the better highways of the State. The guide boards will indicate not only the direction to be followed from one place to another, and the distance, but also the best route and the most important characteristic of the road—whether hilly, sandy, rocky; the sign posts will be placed at the side of the road in the neighborhood of dangerous hills, turns, and unusual obstructions to give the traveler warning in time, and will point the way at points where supplies and repairs can be obtained nearby.

Several years ago when the Rhode Island Division of the League of American Wheelmen was in a flourishing condition, the officers and members of that organization did commendable work in obtaining for the traveling public a system of road signs which had long been needed in the vicinity of Providence. Signs erected at the expense of the wheelmen at that time frequently convey to-day the only information readily to be obtained by those who use the roads of the State. The Rhode Island Automobile Club has taken up the work where it was left by the wheelmen. Guide boards, signed by the club, have been posted in various parts of the South County, and give material aid to the members of the fraternity who have occasion to use the highways in the vicinity of Narragansett Pier. It is expected that the work of the club will be carried out thoroughly and systematically throughout the State and will give to Rhode Island for the first time in its history road signs on a par with those of her sister States.

The club is greatly encouraged in the prosecution of this very practical and

A PIECE OF STATE ROAD.

COMMISSIONERS INSPECT ROAD ASSISTED BY CLUB.

LOCATING A DANGER SIGN.

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commendable work by the work of the State Highway Commission which, under authority granted by the Legislature, is each year constructing sample sections of model wagon roads in towns and counties in the more remote parts of the commonwealth. These sample roads are to be each one mile long and are expected to stimulate local pride and energy sufficiently to cause a general improvement, at least of the main highways. The entire mile of road has been completed in some towns, while the commission has started the work in a number of others. Recently the board has begun inspecting these sample stretches of new road, making its tours in automobiles, which afford the members a better opportunity of gaining information than can be had in any other way. The first of these tours was made a few months ago, when the photographs reproduced herewith were taken. A member of the party who went over the route, referring to the use of the autos, said:

"Inspection of roads from an automobile has always produced more practical results in the way of new roads and reconstructed highways than any other method, and added to that is the advantage of completing the inspection in a shorter time than would be possible in any other way. Every imperfection in the surface of the highways that are traveled over is not only seen but also felt, and such evidence has usually proved much more effective than scores of photographs and many pages of typewritten matter, added to the frantic appeals of interested farmers made in the warm, well-carpeted committee room in the new marble capitol."

Members of the Automobile Club of America enjoyed a holiday smoking concert and supper, at the clubrooms in New York last Tuesday evening. There was a good attendance, many prominent members being present.

Thirty-two entries are said to have been received for the Ormond-Daytona Beach races, but the names are withheld.

SUMMARY OF CHANGES SEEN AT THE PARIS SHOW.

Closely Packed Gill Radiators Hold Their Own Against Cellular Pattern--Steel Cylinders in Costly Cars Only.

AUTOMATIC CARBURETERS NOW UNIVERSAL.

PARIS, Dec. 14.—While last year's show was a beautiful tribute to the Mercedes car and illustrated how the industry of an entire country could be stampeded in a certain direction, this year's show indicates that the makers have regained their wits and are devoting their energies along rational lines of improvement. There is a marked absence of freaks and inventions destined to upset our preconceived notions.

The pressed steel frame has effectually crowded out the tubular frame, but not the armored wood type, which continues to be used by many prominent firms.

The automatic carbureter is shown in one form or another on most of the machines.

Steel cylinders are only used where, on account of large size, they can be made much lighter and high cost is not prohibitive.

Honeycomb radiators are not so universal as was expected, closely packed gill radiators of equal efficiency being used on many cars.

Valves show a tendency toward mechanical operation for inlets as well as exhausts. There is also a tendency to placing all the valves on one side of the cylinders, or one set of them in the cylinder heads.

Cylinders are cast separately in many engines formerly cast in pairs.

Ignition by magneto seems to be growing, but many cars are equipped with both magnets and jump spark.

Change speed gears show nothing new, but a general refinement of design and general enclosing and protection of all working parts.

Ball bearings are being extensively used and are generally of the non-adjustable type. In one case they are used on the engine crankshaft.

Three cylinder motors are used by Panhard and several others and promise to be a dangerous rival of the two cylinder.

Bevel gear drive is used almost entirely on cars below thirty horsepower. Above that power, side chains seem to be preferred.

The general tendency is to the perfection of detail, simplification of the control and suppression of noise.

E. T. BIRDSALL.

SPEED TRIALS AND PREPARATIONS AT ORMOND-DAYTONA BEACH.

A number of preliminary speed trials on the Ormond-Daytona Beach have been made this week in anticipation of the big tournament to immediately follow the New York Show, and the beach is reported in excellent condition. W. J. Morgan, representative in the North of the Florida East Coast Automobile Association, which is promoting the tournament, left for Florida a week ago in company with C. C. Hildebrand, of the J. Stevens Arms & Tool Co., and Otto Nestman, who will drive the Stevens-Duryea car which made such a good showing at the Eagle Rock Hill climbing trials in New Jersey, on Thanksgiving Day. A. G. Batchelder, of New York, was also in the party.

At Ormond the party met Charles Schmidt, with the Packard "Gray Wolf," which he designed. S. D. Waldon, sales-manager of the Packard Motor Car Company, was an interested spectator during the week of the preliminary arrangements for the winter meet. S. M. Butler, secretary of the Automobile Club of America, is also at Ormond Beach superintending the installation of the Mors electric timing apparatus, which is to be carefully tested and approved before the races.

Much interest has been shown in automobile circles in the entry of W. K. Vanderbilt, Jr., for the Florida races, especially as he has entered for every event open to him, not caring to confine himself to the limitations of the special invitation races.

A committee of business men in Allegan, Mich., is negotiating with a Chicago automobile concern which claims to employ 200 men and is contemplating removing its factory to some Michigan town provided a bonus of $20,000 is offered.

Five Paris policemen have passed examinations as motor car drivers and will soon be put on duty with fast cars to overtake and arrest, if necessary, drivers of vehicles who exceed the legal speed.

A number of new automobiles are seen on the streets, three French machines having passed through the custom house during the past week.—*Havana (Cuba) Post.*

WHERE THE SAMPLE MILE JOINS THE OLD ROAD IN NEW ENGLAND.

Principle of Acetylene Lamps.

BY S. W. RUSHMORE.

As the speed at which an automobile may be driven over a dark road depends as much upon the power of the lights with which it is equipped as upon the power of its motor, it would seem that the principles involved in the operation of the acetylene headlight, to which this article will be confined, should be understood by every motorist.

Acetylene is a gas composed of equal parts of carbon and hydrogen and has an illuminating power approximately twenty times that of common coal gas. Although it has come into extensive use only during the last few years it has been known for a long time and was discovered in 1836 by an English chemist, Edmund Davy.

At the present time acetylene is produced by the action of water upon calcium carbide, a hard dark-colored rock-like substance produced by fusing together in the electric furnace a mixture of lime and coke, and having the chemical formula CaC_2. The carbide has a powerful affinity for water and when the two are brought together there is a double decomposition:

Calcium Carbide (CaC_2) plus Water (H_2O)
equals
Common Lime (CaO) plus Acetylene (C_2H_2)

When only a small quantity of water comes into contact with a mass of carbide the above reaction is approached, but in practice, with the excess of water the waste lime always has the composition of the hydrate ($Ca.HO_2$.)

The generation of acetylene by bringing calcium carbide into contact with water is so very simple that it is hardly credible that there have been issued hundreds, if not thousands, of patents, and the list is still growing.

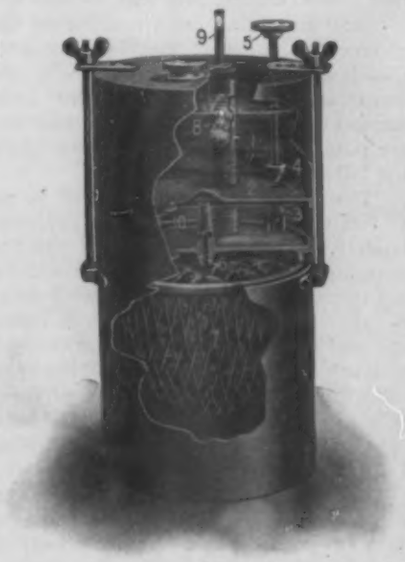
Acetylene generators may be divided into two great classes, those into which the carbide is dropped a small amount at a time into an excess of water and those in which water is fed onto the carbide. The first-named class is used exclusively for general illumination, but with its cumbrous gas and water tanks is obviously impractical for vehicle use, and thus in all automobile generators the water is fed upon the carbide, drop by drop, or is allowed to gradually soak into it from below.

Nearly all automobile generators on the market to-day are of the water drip type and all carry the carbide in a closed cup or chamber from which the resultant hydrated lime is later removed.

The troubles experienced with such generators are due chiefly to the fact that after operating for a short time the carbide becomes covered with a layer of pasty lime through which the water passes too slowly for any automatic action to be possible and that, as the carbide expands about 25 per cent. in slacking, the mass of lime becomes so tightly compressed that it must often be dug out of the container with a chisel. Such generators must always be re-charged after every period of use, as the moisture contained in the layer of wet lime continues to attack the unconsumed carbide long after the light has been extinguished.

The decomposition of calcium carbide is accompanied by the liberation of a large amount of heat and where the waste lime forms an insulating covering around the mass, the interior will often become nearly red hot, decomposing the acetylene and forming tar vapors which give the lime a bright yellow color and clog up the tiny holes in the burners with carbon deposits.

Recognizing the defects of all generators then on the market, the writer several years ago undertook to produce for locomotive headlights a generator of the water drip type that should be perfectly automatic and easy to re-charge, and laid down the following as essential requirements:



1. The carbide must be supported in such a manner that it shall be freed from the waste lime as rapidly as formed, so that the action of the water drip shall always be instantaneous and so there shall be no local overheating of the carbide.

2. The waste lime must be kept out of contact with the unused carbide, so that the loss from after generation shall be a minimum.

3. There must be provided some gas storage capacity in order that the gas shall be delivered to the burners at a constant pressure and to provide for a slight irregularity in the rate of generation.

The results obtained with the locomotive generator were so satisfactory that lately a more compact form of generator for automobile use containing the same general features was developed.

This generator, shown partly in section in the accompanying cut, consists of two main parts, an upper portion containing the water tank and gas chamber and a lower part or generating chamber that carries the carbide holder and receives the waste lime dust, the two parts being clamped together by means of the swing bolts shown, a rubber gasket embedded in the upper portion making a gas tight joint.

The carbide used is the cheap commercial lump, which yields much more gas than the smaller sizes and is placed in the rounded wire basket 7, through which the lime dust falls as rapidly as it is formed; this action being facilitated by the vibration of the car.

In the upper portion of the generator the water tank extends only to the plate or false bottom 2 which forms a space or chamber 10 into which the water can flow only through the pipe 3, the opening of which may be closed by the plug 4 by turning the small wheel 5.

A water drip tube 6 extends from near the top of the lower chamber to a point directly over the center of the carbide basket. The gas is drawn from the generating chamber for the lights through the large tube 8 which simply passes through the gas chamber and water tank. This large tube is filled with a coarse hair which serves to stop any lime dust that might pass into the gas pipes.

When the generator is charged the valve 5 is closed tight and the water tank is filled to the top. On opening the valve the water will flow into the lower chamber until it is nearly full, when a few drops will overflow onto the carbide. The gas instantly generated stops the flow of water and by its pressure forces some of the water up the pipe 3 into the water tank.

If no gas is taken from the generator, it will now stand in this condition for weeks or months and no more water can reach the carbide. When the lamps are lighted the pressure in the lower chamber will fall slightly and water will again flow into it from the tank above until a few more drops overflow onto the carbide and the action will be repeated.

It will be seen that the gas pressure will always be equal to the head due to the difference in the water levels in the water tank and lower chamber and that, should the pressure at any time tend to become excessive, the gas will simply bubble through the water in the tank and escape. In practice the water level in the regulating chamber will vary barely one-half an inch and the pressure remains so constant that no variation is noticeable in the lights.

To recharge the generator, it is only necessary to remove the carbide basket, dump out the lime dust in the lower cup, add a few lumps of carbide to make up for the amount consumed and replenish the water in the tank.

Should the recharging be neglected

until all the carbide has been consumed, the water remaining in the tank will flood the dust cup which should then be washed out. As the lime expands to its full extent in the act of leaving the carbide there is no further expansion in the cup and thus the waste may always be removed without difficulty.

This generator with 1 1-4 pounds of carbide will supply a single one-half foot burner for nine or ten hours. It will supply two or more burners for a correspondingly shorter time. It may be forced as much as required and while the whole generator, tank and all may become very warm, there is no excessive local heating, and no decomposition of the gas is possible.

Acetylene Light from Storage Tanks Containing Gas in Large Quantities.

The use of acetylene gas stored under pressure has been considered impractical as an illuminating agent for automobile lamps and for other purposes where only a limited space is at disposal for storage tanks, because the gas is spontaneously explosive if subjected to a greater pressure than about thirty pounds per square inch, so that a sufficient quantity could not be carried unless tanks of very large size were used. Recent developments in this field have largely eliminated the difficulty mentioned, and it is now possible to store a large quantity of acetylene gas under a pressure of at least two hundred and forty pounds with perfect safety, so that sufficient gas to light an automobile lamp for eighty-four consecutive hours can be carried in a comparatively small tank, and the new process is now being exploited abroad and in this country.

Two scientists, Berthelot and Vieille, experimenting in France several years ago, discovered that the tendency of acetylene gas to explode is greatly diminished, if not entirely removed, by absorbing the gas in a suitable liquid, and later, in 1897, Claude and Hess, also French scientists, discovered that acetone absorbs four times as much acetylene gas as the next best known solvent, one volume of acetone taking up twenty-five volumes of acetylene under ordinary conditions of temperature and pressure. They also brought to light the interesting fact that the solubility of acetylene in acetone increases in direct proportion to the pressure, so that under a pressure of twelve atmospheres (176.4 pounds) 300 volumes of the gas are absorbed at a temperature of 60 degrees Fahrenheit. The solubility decreases to one-half if the temperature is raised to 120 degrees.

From this exposition of the peculiar properties of acetone, a liquid related to the alcohols, the formula of which is (C H) 32 C O, it will be seen that a comparatively small cylinder filled with that liquid, in which acetylene has been dissolved would yield a sufficient supply of gas to feed one or more jets for a considerable length of time, especially as it has been found that the gas is given off quite regularly as the pressure is diminished. Another interesting discovery was made early in the development of this method of storing acetylene to the effect that the dissolved acetylene is not subject to the danger of an explosive decomposition unless a pressure of ten atmospheres (approximately 150 pounds) is exceeded; and then only the excess gas, which must always remain above the surface of the acetone, is explosive.

To entirely eliminate the danger of explosion even at high pressures, Edmund Fouche, another French investigato.. early in the year 1900, hit upon the idea, which proved successful, of filling the containing vessel, in which the acetone and compressed acetylene is stored, with a porous material, such as asbestos or porous brick, leaving no space above the liquid for the collection of explosive gas, thus making the new process entirely practical.

Some interesting facts relating to the commercial value of the inventions of Claude and Hess and Edmund Fouche, the American rights to which have been secured by The Commercial Acetylene Co., are published in a pamphlet, from which the following is quoted:

"The ordinary sailing yacht of 70 to 90 feet water line, would require, approximately, 14 lights. In ordinary use the consumption on such a boat would be not more than 200 cubic feet per month. A cylinder measuring 12 inches in diameter and 36 inches in length, when charged with asbestos and acetone would hold 330 cubic feet of acetylene, and two of these cylinders would supply such a vessel with light for an entire season at a cost of about $33.

"Take, as another example, a sailing yacht of 45 to 50 feet water line length. Such a yacht would require about 8 burners, which would consume, approximately, 125 cubic feet of acetylene per month. A cylinder 10 inches in diameter and 30 inches in length, when charged with asbestos and acetone, would each contain 200 cubic feet of acetylene, and two such cylinders would supply such a boat for one entire season at a cost of about $20.

The ordinary railway car cylinder (10 feet 4 inches long by 20 inches diameter), having a normal interior capacity of 22 cubic feet, will hold 220 cubic feet of ordinary city gas at 150 pounds pressure; whereas, when charged with brick and acetone, this same tank, with the same pressure, will hold 2,200 cubic feet of acetylene, or ten times the normal cubic capacity of the tank.

"Such a tank would contain sufficient gas to supply an ordinary railway car from New York to San Francisco and back four times without recharging."

A number of automobiles belonging to well-known motorists in New York have already been equipped with this system of lighting, although this branch of the business has hardly been entered so far, and arrangements have just been completed for introducing the new system extensively to automobile dealers and private owners. The cylinders designed for automobiles are made in three sizes, the largest being seven inches in diameter by twenty-four inches in height. The weight of this size cylinder is thirty-seven pounds and its capacity is eighty-four cubic feet of gas. In other words, the cylinder will feed a lamp having two one-half foot burners—the average size—eighty-four hours' consecutive burning, or five hours a night for approximately seventeen nights. The charge for gas is five cents a cubic foot, at present, or $4.20 for eighty-four hours' supply. Charged cylinders are carried in stock in New York so that there need be no delay in renewing a supply of gas, and users living at a distance can obtain continuous service by purchasing two cylinders, keeping one charged cylinder on hand.

The Automobile Translator.

An English customer applied to a French automobile firm for instruction in the use of one of their cars. In reply they sent him a set of directions which indicate an heroic struggle with a dictionary. "For making the mover walking" (in English, starting the motor), the first instruction is: "Lean on the pointeau of the carburateur, till the essence unbordes"; the fourth operation is: "Push thoroughly the handle on, and hurl the mover till his starting"; and the fifth: "Increase the advance to the lighter with an eighth of lathe forward at the right; then, take sensibly back at left backward the second manette with a fifth of lathe; just as this moment, the mover must goes regularly with 1,500 lathes; for making it slacken without touching the two first manettes, put the big manette of the moderator at the last but one notch going at left." After that it is easy "to making the carriage walking at the first speed" and "to making it stopping," while "for the backward step, take back the crowbar in little speed and in debrayage if you will stopped." It is to be hoped the car is easier to drive than it sounds.—*World's Work*, London.

The ordinance recently passed by the Los Angeles council requiring automobiles to be numbered has gone into effect and conspicuous figures are now seen on all the cars on the streets. There was some rivalry among the motorists to get certain numbers. Dr. Milbank Johnson, president of the Automobile Club of Southern California got No. 1, although M. W. Connor, who secured that number under the former ordinance, which was superseded by the new law, thought he was entitled to it. Dr. Ralph Hagan got No. 13, which was much sought.

Care and Repairs of Fire Tube Boiler Steam Cars.

John H. Macalman, manager of the Boston branch of the Locomobile Company of America, delivered the fifth lecture in the Boston Y. M. C. A. course on steam vehicles. His subject was "The Care and Small Repairs of a Steam Motor Car." He spoke, in part, as follows:—

This number on your program calls for a talk on the care and small repairs of a steam motor car. I believe that if a man operating a steam car would stop to think of the care given stationary machinery in comparison to what he is willing to give his car, he would wonder how the car is kept going at all. We will confine ourselves to the fire tube boiler type. To insure the maximum efficiency of this type of boiler a certain amount of care is necessary. When first firing up and the steam-gauge begins to show a pressure the blow-off valve should be opened to let a small quantity of water be discharged. The sediment which is settled on the bottom of the boiler is disturbed and begins to rise when the water first boils, and more impurities can be removed by means of the blow-off valve than in any other way. When the steam reaches fifty or sixty pounds the sediment settles back and is not easily disturbed. If the impurities are permitted to remain on the bottom of the boiler they will form a non-conducting scale, covering the plates and lower ends of the tubes, which will interfere with steaming. The cleansing of the boiler removes to some extent the liability of burning it, which is too often caused by sediment clogging the circulating system, including the check valves on the water column of gauge glass.

The water in the gauge should fluctuate with the motion of the carriage, and if it remains stationary, clogging is indicated. The remedy for this is to tap the checks and open the water column gauge until the sediment is cleaned out. It is absolutely necessary that the operator be perfectly sure of perfect circulation. To be sure of uniform steaming capacity, the fire must be able to meet the varying demands. This regulation is usually secured by the so-called "automatic"—which is a needle valve actuated by the steam pressure on the diaphragm—the valve closing as the pressure increases to some set point and shutting off the fuel supply. Care should be taken that the packing of this valve in neither too tight nor too loose, as in the former case it fails to work promptly, and in the latter is liable to leak, and thus destroy the efficiency of the whole. Another source of trouble is the cracking or breaking of the diaphragm, which should at once be replaced.

The gasoline system should be washed out occasionally in the following manner:—Open the torch valve and let a small quantity of cold gasoline through under high pressure. This will soften and remove part of the scale and grit, and thus prolong the free flow of gasoline. The jet valve on the automatic should be cleaned out from time to time. This may be done by unscrewing the jet valve and removing the small plug opposite the jet nozzle. The scale may be removed with a small piece of wire. The plugging of the jet valve interferes with the air mixture, prevents a good fire and sometimes causes the burner to fire back. Any retort for vaporizing gasoline is good, if it vaporizes fast or slow as is required. This feature is necessary, as gasoline may be consumed in a hot retort, while the boiler is not making much steam, causing a waste of fuel. To force gasoline through a retort that does not vaporize properly, crowds an imperfect mixture into the burner and also wastes fuel. Perfect vaporization and perfect mixture produces economy.

Lubrication is an important feature of the care of the engine. With those commonly used, all moving parts must be lubricated. Two kinds of oil are required; first, where the steam is in direct contact with the movable parts a special grade of oil that will not burn or be disintegrated by the heat is required, and only enough oil should be fed to form a mixture with the steam and keep the surfaces coated, and permit the engine to start easily without undue grinding or squeaking; second, the external parts must be oiled with a lubricant of such consistency that it will not quickly run off. A little oil will do just as much work as much, and promotes cleanliness. The engine should be washed with kerosene to remove extra oil and grit. Before starting a car, after the steam is up, the operator should open the throttle slightly and move the carriage backward and forward. This will warm up the engine and drive out the water formed by condensation in the cylinders. If the water is not removed the cylinders may burst, bolts be stripped, connecting rods bent or broken or piston packings blow out. Too much water in the boiler sometimes causes the same results, the water boiling into the engine in place of steam. This is called priming and is shown by the blowing sound of the exhaust and the diminution of power.

From time to time the operator should jack up the rear wheels of the carriage and run the engine slowly, keeping a close watch upon its different parts. The reciprocating parts must be kept in adjustment and an examination with the engine going slowly shows where adjustment is necessary. The pumps and check valves can also be tested. Check valves have to be reground occasionally and the valve faces must always be smooth and bright. The auxiliary water pump should be directly connected with the boiler. All running gears that are driven from a compensating gear in the center are more or less weak at that point, and the great amount of strain on them is apt to throw the gears out of alignment and make the car run hard. The crank shaft drive with chains running direct to sprockets on the rear wheels permits a solid axle and a strong rear frame.

There are three separate ways in use for connecting power to rear frame—the bevel gear, direct connection with engine and chain drive. The chain drive is the most economical and the easiest to adjust, and a few extra links on hand always means easy repairs.

There are many different kinds of burners in use, but the steel tubular burner has given very good satisfaction. The burner is often blamed for inefficiency when the trouble really lies in the air mixture and fuel feed. A poor burner is often benefited by some means of covering it or giving it more air, as the case may require. Firing back by the burner is sometimes the result of improper adjustment of the mixing tube and sometimes the result of the jet valve being in the wrong position. Opinions differ as to the merits of the torches and generators in use for firing up steam cars. The old hair-pin torch is a good stand-by, as it is always easy to adjust and is a sure way of getting vapor.

Provisional Repairs.

Experience has shown me no easy way of repairing a boiler on the road. Putting oatmeal in the boiler to stop a leak has been suggested, but this is bad policy, as it is almost impossible to get the meal out again. The only way to repair a burned boiler is to carry along the proper expanding tools. Having the tools on hand, it is necessary to stand the carriage on end and remove the burner. If the burn is slight, the bottom may be caulked without removing the top hood. Use of the hand pump will show if the caulking is successful If the boiler remains tight when the steam gauge shows a pressure of 300 pounds of water, it is evident that the boiler is tight. This work is really the province of a machinist.

Many repairs may be made to an engine which will do until a regular repair shop can be reached. Sometimes the engines may be disconnected. This method may be employed when a connecting rod is broken. The method is to disconnect the small rod that joins the links with the bell hanging crank, center the engine by having the eccentrics throw the link square across the engine, having the line block in the center. Whittle a piece of wood to fit in the link on either side of the block and with the wood in this position the ports in the cylinder will be closed. In starting the engine the link will act as a walking beam and will not move the valve stem enough to uncover the ports. This

is perfectly safe. Another way is to disconnect the eccentrics and tie them up in such a manner that they will not entangle themselves in the engine. Then see that the valve slides cover the ports and block the steam, so that the slides will keep in position. Before the engine is started the broken connecting rod must be removed, or it will become entangled in the engine, the crank moving as before.

When a car is not to be used for some time all water should be drawn off. It is then advisable to take a small quantity of sal soda—about a cupful—dissolved in warm water, and pump it into the boiler. Then fill the boiler nearly full of clean water, start a slow fire, gradually bringing the water to the boiling point and keeping it there for ten minutes. Then turn off the fire and blow the boiler until dry. This leaves a coating which prevents further rust. The water system should be carefully drained, by opening the valve at the bottom of the water column and the small pet cock below the pumps. If the car is equipped with steam water pumps, great care should be taken that they are thoroughly drained and oil worked into the cylinders and valves. It is a good plan to disconnect the pumps and lay them up in a dry place, as the mechanism is delicate and requires careful attention for good results. It is also advisable to cover all nickled parts with vaseline. The engine should be cleaned and well oiled and the steam chest should also be dry and well oiled. Trusses under the car to keep the weight off the tires is good for them. When the car is to be used again it should be fired up and blown off.

BOSTON Y. M. C. A. AUTO SCHOOL EXAMINATION IN STEAM CARS.

BOSTON, Dec. 28.—Largely for the purpose of ascertaining whether the methods of instruction adopted by the Y. M. C. A. automobile school in the steam course just finished are correct and effective, the managers held an examination on Saturday night, December 19. About 100 of the students enrolled in the school attended the examination and the percentage of correctness attained by most of them in their answers was very gratifying to the committee in charge of the school. Several students, who, previous to entering the school, had no experience whatever with any kind of mechanism, passed the examination with creditable marks. Later, another examination will be held for those who wish to qualify for certificates, and they will also be required to prepare a thesis upon some type of steam car.

In the examination thirty questions required answers and eleven others were to be answered at the option of the students, the answers being taken into consideration in awarding special credits. Sixteen of the required questions were upon the mechanical features of the steam car, and fourteen were upon care and repairs. The students were required to describe three kinds of boilers, the fusible plug, the thermostat, operation of the engine, steam chest, power transmission gear, the advantages of liquid fuel, the condenser, oil separator, pump, and other parts. They were also asked how to repair leaky tubes, how to clean boilers, to give a description of proper lubrication, and to describe how a car should be laid up for the winter.

The gasoline course in the school will begin January 5, and will be in charge of Albert L. Clough. In the shop course the school managers have secured for dissection a Crest and a Cadillac as examples of the runabout type, and a Toledo and one other as examples of the touring car.

Commercial Vehicle Trials in March.

The contest committee of the Automobile Club of America has announced that the proposed contest for light and heavy commercial vehicles under the auspices and management of the club, will be held March 15 and 16. The rules and full particulars of the event will be announced later.

JAMES WHITCOMB RILEY, THE HOOSIER POET, ON A THANKSGIVING DAY RIDE.

The Famous Versifier of Homely Truths Consents to Emulate the Spirit of Modern Locomotion in a Haynes-Apperson Surrey. Mr. Riley in Right Front Seat.

Engineering a High-Speed Launch.

BY HERBERT L. TOWLE.

Had a power launch enthusiast of five years ago been told that it was possible to put a 20-horsepower gasoline engine into a 30-foot hull weighing under 500 pounds, or a 40-horsepower engine into a 40-foot hull of correspondingly light weight and with these outfits to make speeds of from nineteen to twenty-two miles per hour in slack water, he would have considered his informant lacking in discretion, to say the least. Yet that has actually been done within the last few months, and done with such seeming ease that it is already possible to say that the limit both in power per unit displacement and in speed per unit of power is still ahead of us. With such ease, too, have these and earlier steps been made, and so free from objectionable qualities are the boats which have resulted, that the air is thick with rumors regarding speed launches soon to be forthcoming, converts are daily being made, and there is every prospect of a speed launch "craze" next year, with impetus enough to carry it well into the undefined future.

So rapid a bound—one can hardly call it a step—forward could not fail to unsettle many ideas till now held as gospel by launch owners and builders; and no doubt many in both classes are still shaking their heads over these abnormal productions, saying that such boats can't help shaking their passengers' teeth out, that they wonder the motors don't jump out of the hulls, and that they themselves couldn't be hired to ride in one, much less own it. They admit that motors more or less similar are used in automobiles without destructive results, and they admit that that fact ought to be sufficient explanation. Nevertheless, it is so completely antipodal to their ideas and experience as launch owners that, unless they are automobile owners as well, they are likely to have no small difficulty in adjusting their previous conceptions to recent facts.

A year or two from now all of these doubting Thomases whose purses are of the proper depth will be hastening to recognize the new order of things by placing orders, each for a boat to beat the fastest among his neighbors, and wishing they had done it sooner. Some of these, perhaps, will be helped a little by the following non-technical explanation of how it is that the seeming marvel is worked.

Perhaps it would be best to begin by remarking that all of these very fast boats are smooth-water boats. To substitute a 20-horsepower motor for one of ten horsepower, even if the former weighed but half as much as the latter, would avail little if the same hull, designed for, say, nine miles an hour, were retained. Consequently motor and hull must go together. The high-speed hull is narrow. The beam of the fastest torpedo boat or crack liner is hardly less than one-eleventh of her length. The beam of a gasoline speed launch is one-seventh, one-eighth, or one-tenth of her length, from which it will be seen that there is little margin to spare. Besides that, the draught of the hull is very shallow—a few inches only, rarely a foot in small or medium hulls, unless the "inverted wedge" style of design is used. More than all, her underbody has the flattened form at the stern which has come to be recognized as essential in all fast power craft, to prevent the stern from "squatting" and rolling up big waves.

Such a boat, built as light as these boats sometimes are, is manifestly out of place in rough water, and is, in fact, only another instance of specialized design for a particular purpose. However, this will be partly offset by the fact that she can make port, when a storm is brewing, in about half the time needed by the seaworthier but slower service boat.

Having disposed of the hull question, the engine and screw may be considered. It will be obvious that most of the great gain in power per square inch of piston head area, which has marked the transition from the old to the new type of engine, is due to increase in piston speed; and many people are convinced that a smaller propeller screw can not be run much above 600 turns per minute without loss of efficiency. Undoubtedly that is sometimes true. If, for example, a screw of given diameter and pitch, designed for a small power and slow speed, be taken and altered for a higher speed, without increase of power, by simply reducing the pitch, the result will be disappointing. But if the same screw be taken and its diameter cut down, while retaining its pitch, it may be run at a higher speed and will transmit a greater thrust and higher power. The principal thing that counts is not the speed of the screw, but the pressure per square inch on the blades. So long as this does not exceed 10 or 12 pounds, no ordinary combination of screw speed and hull speed is likely to prove intractable. As to the former, speeds of upward of 900 turns are already in successful use, and it does not seem likely that the limit will be reached below the limit of motor speed. We have, therefore, only the motor itself to think about, or rather the adaptation of the motor to the hull.

The principles of success here are at bottom the same as have been recognized in connection with automobile work, but they are somewhat specialized in their application. First and foremost, the vertical vibration due to the pistons and connecting rods absolutely must be got rid of, —all of it if possible, and most of it anyway. The only practical way to do this is to use more than one cylinder, and thus the single-cylinder engine is ruled out at the start. Even two cylinders will not do it, if the "real thing" is wanted in the way of speed. If the pistons work on opposite cranks, the impulses are irregular, and there is a fore-and-aft rocking or see-sawing tendency which is both detrimental and unpleasant. If they work on one crank they shake the boat to pieces. Three cylinders at least are required, with the cranks 120 degrees apart, to give a fair mechanical balance, and four cylinders, with the second and third crank pins opposite the first and fourth, *not* with the first and second opposite the third and fourth, which produces objectionable see-sawing, are better yet. Four, in fact, is the common and most generally suitable number.

Besides the need of balancing the mechanical or piston vibration, there are other reasons for dividing the power among several cylinders. One is to get the engine as low as possible, adding to the stability of the boat and permitting use of a narrow beam. Another is to save weight, since a multicylinder needs very little flywheel. The third reason has to do with vibration again, but in a different way. Every explosive impulse, while it forcibly rotates the flywheel, shaft, and screw in one direction, tends with equal force to rotate the engine and hull in the opposite sense. The hull, in fact, actually does react till the angle of its keel produces equilibrium or until the impulse ceases. Under a rapid succession of small impulses, the hull assumes a given, often imperceptible, angle, and retains it with slight quivering only. Under a slower series of strong impulses, as with the old-fashioned two-cylinder engine, each separate explosion is marked by a distinct jerk. This, of course, is modified in both cases by the natural elasticity of the hull, which permits local absorption of much of the vibration.

It will, therefore, be seen that, although the speed of a given double cylinder motor, say, cannot possibly be raised beyond a certain point, owing to the increasing intensity of its mechanical vibration, which varies as the square of the speed, yet by simply adding one or two more cylinders with the cranks suitably disposed, a large increase may be made in speed. The mechanical vibrations are balanced, and the impulses are rendered so frequent as to produce the effect of continuity in the hull reactions, while they are not increased in intensity. If now, the fifty or sixty per cent. of superfluous cast iron which was put into the old motor "to absorb the vibration" be taken out, and if the pistons and rods in particular are lightened to the limit, the result will be a motor of less weight than the original two cylinder affair and of three to four times the power; and, light as it is, it will be much less of a boneshaker than the old.

Such, in brief, is the process by which motors of unusual power have been devel-

oped for boat use. The development has been natural and inevitable, and the only cause for wonder is that France, with her lately exploited "automobile boats," should have been permitted to steal a march on America, which has been using motor boats, though slow ones, for years. That such a thing should have happened does not speak volumes for the enterprise of the American boat builder. It does not, however, seem too late to repair the delay. Hull design is certainly better understood here than in France; and if the American boat builder is at a disadvantage from his lack of experience in the refinements of automobile motor design, he is at least not fettered by the absurd convention which leads our Gallic friends to transfer automobile motors, crankcase, change gears, clutch, and all, bodily into their boats, with apparently no thought that changed conditions demand changed forms.

Although it was remarked above that four was the most obvious number of cylinders to use, the builder is by no means restricted to this number, if a racing machine be desired. On account of the angularity of the connecting rods, vertical vibration is not absolutely eliminated from the four-cylinder motor. With six cylinders, if the cranks are correctly disposed, there is no vertical vibration whatever, regardless of the length of the rods. It is usually better in a racer to add more cylinders than to increase their size, and in some respects the six-cylinder motor is the ideal one for such craft. If more than six cylinders are used, eight may drive, four and four, on two coupled shafts, the forward one of which may be uncoupled "in time of peace", and the boat driven by the after quartet alone.

The twisting stream of water thrown backward from a powerful propeller is very disturbing to the rudder, and for this reason, if a simon-pure racer of sufficient size is demanded, there is much to be said in favor of twin screws. These have the additional advantage that there is no attendant hull reaction, since they turn in opposite senses; and the fact that the diameter of the screws and slope of the shafts will be less than with a single screw, is also in their favor.

Blanks Out for Cleveland Show.

Application blanks for space at the Cleveland automobile show, to be held in February under the auspices of the Cleveland Automobile Club, have been sent out and already a number of applications have been returned. The club is making extensive arrangements for larger space and the indications are that the affair will be larger than it was last year. Assurances have been given by nearly all the local manufacturers that they will take part, and as the number of local agencies is larger than it was last year, the local patronage alone will insure success.

Correspondence

Vagueness in Catalogues.

Editor THE AUTOMOBILE:

THE AUTOMOBILE, containing, as it does, timely articles on every department of motoring, complete expositions on new machines as they are brought before the public, side lights on the various improvements constantly taking place and technical articles covering the various component parts of the automobile, is a complete magazine, and to add anything in that line to its well-filled pages would be to cover very well traveled territory, but as a probable purchaser of an automobile, and a part of the public, there is one fact to which I wish to call the attention of the manufacturing readers. It is that of the vagueness in the majority of catalogues describing machines. A catalogue is, to a great extent, "the man on the road," and at all times a representative of the particular car which it is supposed to describe. But does it fulfil its mission? A careful perusal of a pack of pamphlets, circulars and catalogues fails to show me many paragraphs answering the question. I read that car has 5, 7, 8, 10, and up to 60 hp., but not a word why this or that particular horsepower has been adopted. I've read that a car will run thirty miles an hour, but not the per cent. grade it will negotiate on each gear. Why does one use jump spark and the other make and break? Each has his own particular reason and belief, but the catalogue should tell why he has that faith and his reasons, and then the reader can judge between them. As far as I have gone, it has not been settled whether the battery or dynamo gives the best results. If a manufacturer decides on the one or the other, the prospective buyer is interested and vitally interested in knowing why. Then there is the chain and bevel gear drive, a point of difference in many cars. If the manufacturer of each would set forth why he adheres to that particular style, would it not be an enlightenment for the inquirer? For, if he goes about it in a systematic manner, he examines many catalogues, and the more information he can secure the better it will be for the maker of the particular car which is well explained. The same is true of nearly every part about an automobile. I'm told that a double cylinder engine, bore 4 inches, stroke 5 1-2, by one manufacturer develops 12 hp;. by another 16; and some even put it as high as 20 hp. Why does one secure greater results? These are important facts to be considered, and I think have great bearing on the sale of the different machines. Understand, it is not to be thought from this that the automobile catalogues are accused of being inferior to those in other lines of business, describing other products, for they are not. But it is rather that the business, practically speaking, is only in its infancy and demands radically different treatment. The public generally, and those who are desirous of purchasing a machine need enlightenment. They must be told why one machine is the better. The catalogues to-day are the primers of the automobile industry to be spelled out, as it were, by the public and digested as are the A B C's. It is a style of advertising, entirely different from that of any other business, just because the technicalities are not understood at present. The catalogues, comparing them with those of other trades, do not fall behind, but they should be so far ahead in clearness, in the amount of technical information in plain language, and so exhaustive, that there should be no comparison with ordinary commercial catalogues. Until those who write the matter for the catalogues see this, and understand that every word they contain should be addressed to a public confessedly ignorant of automobile construction, many sales will be lost, perhaps to be gained by the one who pays as much attention to the details of the "man on the road" as he does to the construction of the car which the catalogue is supposed to faithfully represent. JOHN W. FEW, JR.

Middletown, Pa., Dec. 26.

Stopping a Runaway Team.

Editor THE AUTOMOBILE:

On my way down Central Park West last Saturday about 9 p.m., as I was nearing 82d Street, I heard a runaway team coming and, looking back, saw it just in time to pull out of the way. The horses were going about twenty or twenty-five miles an hour, but the old Winton held them quite easily. Just below 81st Street I managed to get the reins, but saw it was impossible to stop them that way, as I was pulling them right on top of the machine. I kept the machine close to their heads and had worried them by hitting them in the eyes with my glove. When we got near 72d Street I managed to get the rein on the inside horse and pulled them into the curb in front of the Majestic Hotel. When the wheels hit the curb it was like holding an iron on an emery wheel, the sparks flew so fast, but they stopped without doing any damage, except breaking one of my small lamps.

I was alone in the machine, which gave me very little chance with them, as any automobile user knows it takes nearly all one's attention to manage his machine when going above twenty miles an hour on one of New York's busy streets. The team was owned by Rothenberg & Co., dry goods dealers. The driver fell off and was seriously hurt. ARTHUR H. GREEN.

New York, Dec. 22.

Eleven thousand automobiles were sold in this country in the last twelve months. At an average of $1,000 each, that means $11,000,000 in machines using Rockefeller's gasoline.—*Seattle (Wash.) Times.*

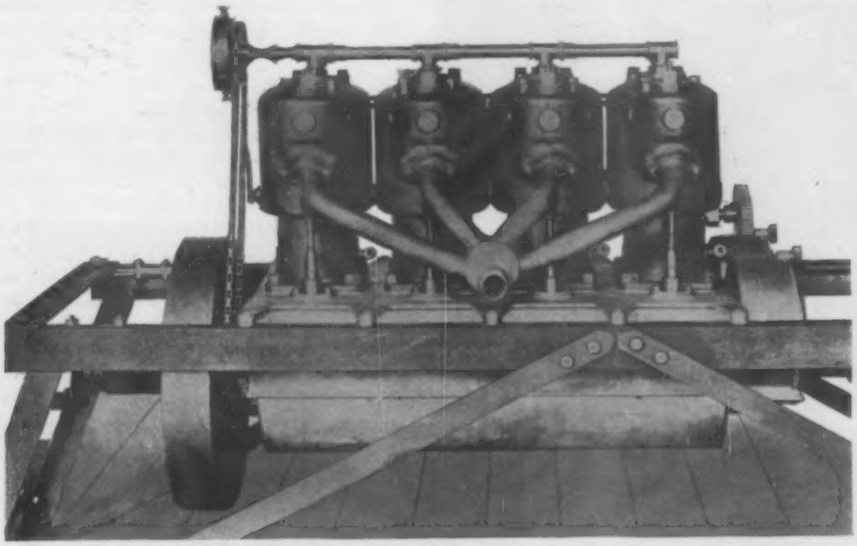
Howard Runabouts and Tonneau Cars.

With all the facilities of the launch and shipbuilding plant of the Gas Engine and Power Company and Charles L. Seabury consolidated for productive work, the Howard Automobile Company is putting out for next season a line of runabout and tonneau touring cars all having vertical motors under the hoods and bevel gear drive. Twenty-five of each style are now coming through the shops in the first lot, the engines and transmission gear being made in the Morris Heights shops of the Gas Engine & Power Company on the Harlem River, and the cars being assembled and fitted with bodies at the works of the Howard Automobile Company in Yonkers, N. Y. The officers of the two companies are the same, so that the output need be limited only by the demand, since the boat works has large departments fully equipped for and experienced in designing, metal casting, forging, machining, copper smithing and woodworking.

Under the name of the Howard Automobile Company, space has been taken in Madison Square Garden for a display of several models of the 1904 cars at the January automobile show. Two of these are now being fitted with aluminum bodies, while another that is being assembled at Morris Heights, has a combination enclosed body of special design.

The runabout and regular touring car chassis have the principal features of construction in common, such as reachless frames, (angle iron in the runabout and pressed steel in the touring cars), bevel gear drive from central shaft, conical elliptic springs. The motors are designed after the German engines, with the cylinders cast separately, and the water jackets being integral with them. The cylinders are made in two styles—with suction intake and mechanical exhaust valves on the same side, and with the intake and exhaust valves on opposite sides and all mechanically operated. The valves are copied after the Panhard valves and have flat seats. The spark plugs are inserted at the top of the inlet valve chambers where they will be swept by the fresh gas. The cylinders are mounted on the aluminum crankcase in single and double units for the runabouts and in triple and quadruple units for the larger cars. The cylinders are made in two sizes—4 by 4 inches and 4 1-2 by 5. The runabouts are equipped either with one cylinder of the larger size developing 6 horsepower or two of the smaller size giving 8 horsepower. The touring cars have two 4 1-5 by 5 cylinders, 12 horsepower, three 4 by 4 cylinders, 12 horsepower, three 4 1-2 by 5, 18 horsepower or four 4 1-2 by 5, giving 24 horsepower.

HOWARD RUNABOUT WITH VERTICAL ENGINE AND BEVEL GEAR DRIVE.



MOTOR OF HOWARD TONNEAU, CARBURETER SIDE—ON ASSEMBLING STAND.

flywheel clutch, sliding gear transmission with the jack shaft hung directly below the main shaft, vertical motor forward, aluminum crank and transmission gear cases, interlocking devices on the control mechanism, artillery wood wheels and semi-

The engine is supported on a false channel iron frame by arms on the upper half of the crankcase, and the entire lower half of the crankcase can be removed from below, giving access to the cranks and pistons and allowing the easy removal of the crankshaft, connecting rods and flywheel as a unit, from the car. The connecting rods have three-inch crank bearings and the shaft has, besides its end bearings, a bearing between each two cylinders.

The valve cam shafts are housed in the crankcase and the end gears are enclosed in circular boxes cast on the end of the case and enclosed by removable covers. One of these boxes is cut away at the top and the circulation pump is gear driven from the exposed portion of the cam shaft gear. The pump is of the positive eccentric type, with sliding vanes. A ball governor is arranged on the outer face of the camshaft gears (in the engine shown herewith it is on the gear of the exhaust valve camshaft) and is enclosed with the gear. Its yokes are connected with a sliding rod passing through the rear wall of the gear housing and through lugs on the outside of the crankcase. This rod is not directly connected with the throttle and does not regulate the speed on the road, but its end abuts the end of a similar sliding rod extending from the rear of the motor and connected with the throttle button operated by the foot. Thus the speed of the engine is controlled by the driver's foot while the car is moving on the road and the governor is effective only when the car is moving very slowly or is standing still

with the engine running, the purpose of the governor being mainly to prevent racing. It is regulated to keep the motor turning only about 150 revolutions per minute.

The commutator is carried on a bearing on the end of the polished brass water tube that extends along the top of the cylinders and is designed to come just inside the dash. It is chain driven from the crankshaft.

The runabout has a two-speed change mechanism and the touring cars a four-speed transmission. A novel feature is a notched sector interlocking device on the side of the transmission case by means of which the gears cannot be shifted until the clutch is thrown out, pressure on the clutch pedal releasing the gear lock. The brake pedal is also arranged so that the clutch is withdrawn before the brake is set.

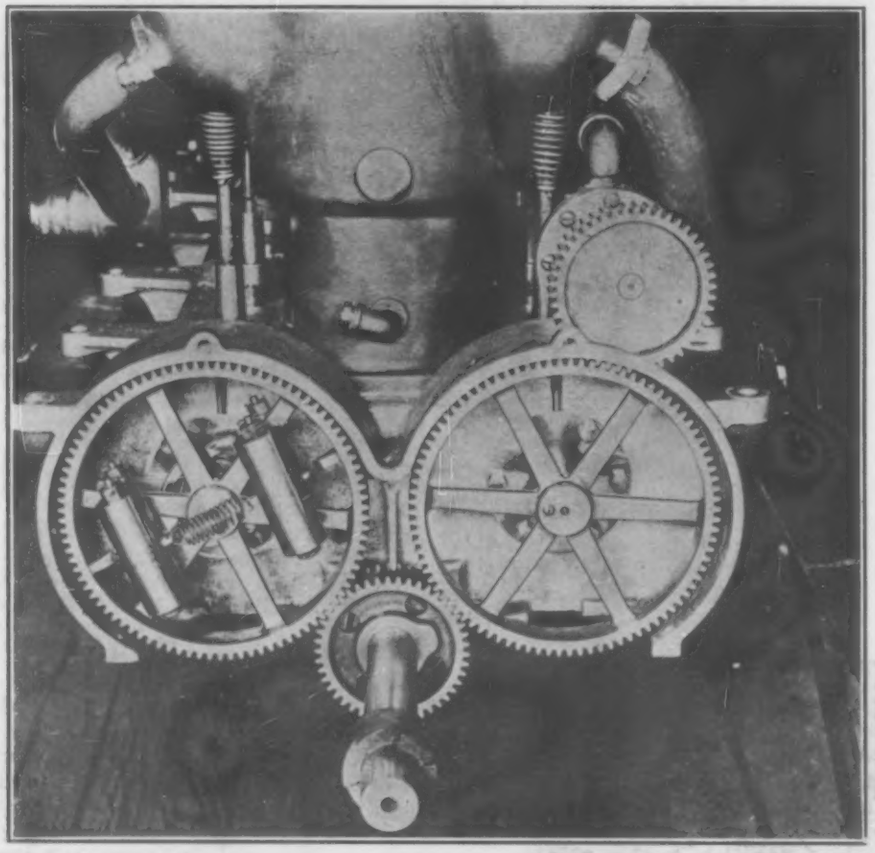
The method of obtaining the direct drive on the high speed is interesting. The last or rearmost pinion on the main shaft has internal gear teeth as well as external and when shifted to its farthest back position fits loosely over a pinion on the end of the driving shaft to the differential.

The runabout has a large disc flange radiator made in the coppersmith department of the Gas Engine and Power Company, but the touring cars have cellular coolers.

By automobile, J. W. Usborne made a trip to Union and back, Saturday, in 40 minutes, and bought a cow.—*Exchange.*

Stearns 1904 Touring Car.

Although several radical improvements have been made for the coming season in the product of the F. B. Stearns Company of Cleveland, the general appearance of the car remains as it was this season. The power has been increased considerably, but the company maintains a rating of 24 horsepower, as heretofore. The cylinders have a volume of 325 cubic inches, and, figuring by the French method of 10 cubic inches to a horsepower, the rating of the car would be 32 1-2 horsepower. The car weighs 2,800 pounds in loaded condition and under the French method this would figure considerably more than one horsepower per 100 pounds.



FRONT OF HOWARD MOTOR, SHOWING GOVERNOR AND GEARED PUMP.

One of the most important improvements is in the oiling system. Heretofore an oil pump has been used. The new system takes advantage of both suction and pressure, and the method of operation is most novel. An oil tank capable of holding two gallons is hung at one side of the frame and a tube from the water circulating system is connected to the bottom of the tank. A check valve prevents the oil from flowing into the circulating system and when the circulating pump is in operation, water is forced into the bottom of the oil tank and the same pressure is maintained in the tank as in the balance of the circulating system. The oil is fed to six sight feed glasses on the dash, and these may be adjusted so that the operator has the lubricating system in plain sight and under constant control. The supply, of course, varies according to the speed of the machine. Tubes from the sight feed glasses lead to the two cylinders, the crank bearings, the main bearing and the secondary bearings. The flow of lubrication is made doubly sure by suction from the crank chamber which is rendered airtight by a ground cover packed with leather. Each connection has a ball check valve at the point where it enters the crank chamber. The crankcase is provided with a pit in which a constant oil level is maintained. The gears are also run in oil.

A radical change has been made in the atomizer. The air enters through a butterfly valve at the side of the upper portion and passes downward through a tube. The gasoline enters through a small tube on the lower portion of the opposite side and passes upward in the small tube through the center of the air tube. The air passing in one direction and the gasoline in the other are mixed in the upper portion of the air tube. The throttle valve controlling the mixture is also of the butterfly type and it is connected with the air valve, both being connected to a foot button, so that the proportion of air is varied automatically according to the mixture required.

The springs are forty-four inches long and are placed outside the frame instead of below. In consequence it has been possible to lower the entire frame three inches. The springs are 7 leaf, 2 inches wide, and the riding qualities of the car have been much improved by these changes.

A new contact breaker is another feature. This is placed at the side of the motor below the frame and it is accessible from the outside of the car. The secondary shaft of the motor extends through the side of its case, and a cam is placed on this extension. The cam is a round drum with two notches cut in, so that contact is formed for one cylinder independent of the other. Two rocker arms are used to form the contacts, the forward arm for the forward cylinder and the rear arm for the rear cylinder. They are held towards the face of the cam by a spring. The rocker arms and cams are grounded and the contact is formed halfway between the cam and the lower support. When one rocker arm drops into a notch, a projection on the arm strikes an insulated plate which completes the circuit for its respective coil. The contact point is adjustable and can be lengthened to take up wear and to regulate the time of sparking. The coil case is placed on the dash.

The intake and exhaust valves are made much larger than heretofore, but the lift is much smaller. By removing the bolts and removing the housing, the intake valve may be lifted out with the fingers; then, by loosening a spring, the exhaust valve, which is directly back of the intake valve,

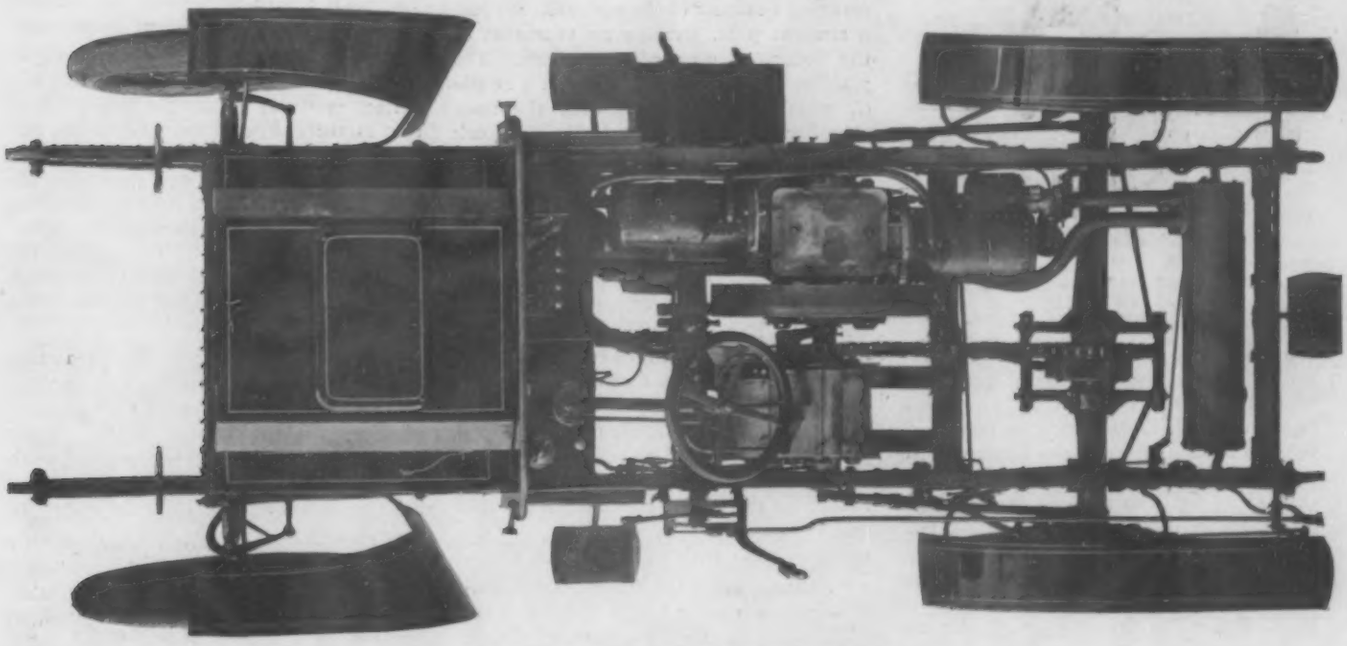
STEARNS 1904 TOURING CAR WITH TWO-CYLINDER OPPOSED ENGINE AND ARMORED WOOD FRAME.

may be removed through the same aperture.

The frame is 11 feet long and the wheelbase of the car 96 inches. The frame is of the armored wood type, consisting of two plates of steel with wood in the center and riveted with numerous rivets. The motor is hung almost exactly in the center of the car and is suspended on two cross arms which are riveted and babbitted in place.

The Stearns motor is of the two cylinder opposed type. The cylinders are separate and interchangeable and are connected to the crankcase by bolts. Cylinders are copper jacketed. The aluminum crankcase is made in two halves, divided longitudinally. By removing three bolts from each cylinder and removing the bolts that hold the crankcase together, the upper half may be lifted off and the main bearings removed and replaced without disturbing any other part of the car. This renders the work of renewing bearings a comparatively simple operation that can be accomplished in a couple of hours by any ordinary mechanic.

The crankshaft is of open hearth forge steel and is turned with an 8-inch flange on the flywheel end, to which the flywheel is bolted. The transmission is bolted to the crank and the bolts run clear through the flywheel and crank flange. But one clutch is used, which acts directly upon the rim of the flywheel. This is operated by a cone and two fingers which tighten a steel band lined with leather upon the outside surface. The transmission consists of three sets of gears, the direct drive being on the high-speed gear. The first and second speeds and the reverse a e obtained through the gears and two levers are used. The drive is by roller chain direct to the live rear axle.



CHASSIS OF STEARNS CAR FROM ABOVE.

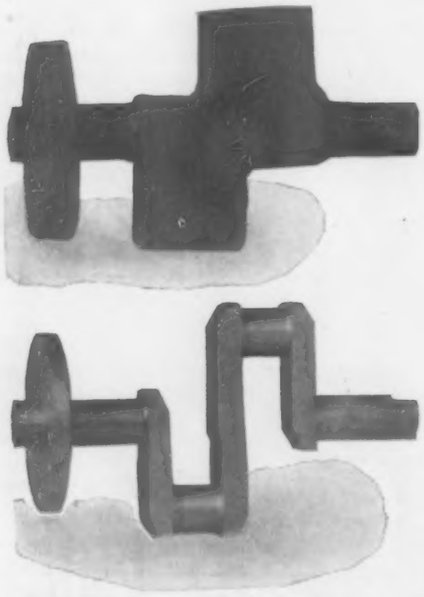
The circulating pump is of the centrifugal type, operating directly on the flywheel. It is adjustable by means of a spring. The radiating coils are in the front of the machine and consist of 12 layers of 1-4 inch tube.

The front spring suspension on Stearns cars has been criticized from the fact that the spring is put in compression by placing the shackled link in front. After using this construction for the past year the makers are prepared to demonstrate that it is the correct method. It is claimed it makes the connection between the steering knuckle and arm rigid at all times and facilitates the handling of the car on rough roads. A tank partitioned off for gasoline and water is carried in front of the dash; it has a capacity of 18 gallons of gasoline and 4 gallons of water.

The throttle and sparker are controlled by a quadrant below the steering wheel, convenient to the driver's hands. On the dash is a gauge showing the amount of pressure in the circulating system; also a grease cup supplying the transmission.

The size of the rear wheels has been increased to 36 inches, and 4 1-2 inch tires are fitted.

The tonneau is very roomy and holds four people comfortably. The seat on the



STEARNS CRANKSHAFT IN THE FORGING AND AFTER MACHINING.

door has been abandoned as being inconvenient. The body is made of light bent wood, linen scrimped inside and out, and a high piano finish is obtained by the use of not less than eighteen coats, hand rubbed.

The Stearns company has recently increased its facilities through the purchase of a number of fine tools, including two large boring mills, a Fellows gear shaper, etc. All work including finishing and upholstering is now done in its own factory. F. B. Stearns is devoting practically his entire attention to the manufacturing end of the business, and the selling end and office management is in the hands of R. M. York.

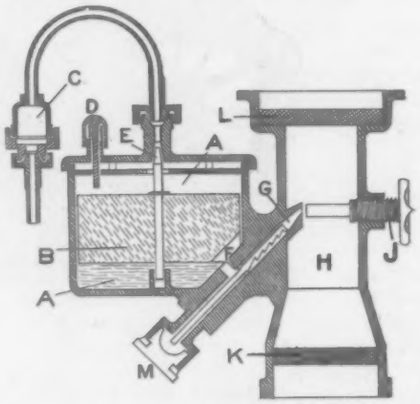
Dunlop's Automatic Carbureter Without Moving Parts.

Dunlop's automatic carbureter, which was mentioned last week, with special reference to the method adopted by Mr. Dunlop for proportioning gasoline and air feed properly at varying piston speeds, is shown in cross section in the accompanying illustration.

A description of this carbureter, for which patents have been secured in the principal countries, is given in *The Autocar* substantially as follows:

A A is the float chamber fed from the top by the curved pipe connected to the cover. *C* is a filter box containing a gauze partition which arrests foreign matter in the gasoline. This gauze can be removed by unscrewing the bottom of the filter box. *E* is the needle valve seat formed in the float chamber lid.

This lid is made double, one part fitting down over the edges of the float chamber and the other entering it, there being short distance pieces between the two. This false lid is fitted to prevent waste of gasoline when flooding the carbureter. *B B* is a cork float carrying the needle valve, which is simply passed through it centrally, the lower end of the needle working in a small boss on the bottom of the float chamber, which keeps it perfectly central, and prevents the float from binding against the walls of the chamber. *D* is the flooding plunger. The movable cap is made to fit down over the boss, this design being adopted so that it is impossible for any water to enter the float chamber. The spraying chamber of the carbureter is just a straight pipe, forming an extension of the induction pipe of the engine. The gasoline enters this tube through a nozzle *G*, which communicates with the float chamber by an inclined hole *F*. The cork float is cut away to clear the metal about *F*, so that there is a free passage for the gasoline. The diagonal tube, one end of which forms the gasoline outlet, terminates in an internally screwed stuffing box, and here the run off plug *M* is located, a gasoline tight joint being obtained by leather washers. Exactly opposite the gasoline orifice there is a flat-ended screw *J*, having a milled head. This screw is horizontal, and is capable of being brought into contact with the nozzle *G*, the face of which is cut diagonally, so as to coincide with the flat end of the adjustment screw *J*. Normally, the screw is a certain small distance away from the face of the nozzle, this distance altering with each separate motor. The nozzle reaches the middle of a straight induction tube, but above and below this tube widens out as seen in the illustration. Below *G* this expansion in the diameter takes a gradual conical formation, afterwards continuing as a parallel tube; above, the increase in diameter is sudden, coming to the greater diameter immediately. Below the nozzle and at the point of greatest diameter of the coned portion of the pipe there is a wire gauze partition *K*, and this gauze is slightly dished. Above the nozzle and just above the end of the pipe containing the nozzle, there is a second gauze partition *L*, which is per-



J. B. DUNLOP'S CARBURETER.

fectly flat. The action of these gauzes we will explain shortly.

The automatic adjustment of gasoline and air in this carbureter is due to the notched wire lying in the diagonal tube between the gasoline orifice and the plug *M*. It is simply a piece of metal wire having a series of saw-like teeth cut deeply into it on one side. This wire is just sufficiently bent to hold itself in position when pressed up the tube between the float chamber and the air pipe. The collar on its middle portion has segments cut out of its edge to permit the free flow of gasoline. The plain extension beyond the collar is only for purposes of removal if necessary.

The proportions of fuel and air being required to remain constant at all times in a perfect mixture, no matter how much of that mixture is being supplied by the carbureter, they must also remain constant at all speeds. That is to say, supposing the speed of an engine to be doubled, and the amount of air drawn through the carbureter in a given time to be also doubled, the amount of gasoline that is sucked through the jet is more than doubled, thus rendering the mixture faulty.

Mr. Dunlop discovered that the action of the saw-like teeth on the wire corrects this tendency on the part of the engine to suck up too much fuel. If the reader studies the shape of the wire and its teeth and considers the effect of a stream of any fluid projected against them he will probably be able to grasp the idea of its action. The reaction of the liquid striking into the crotch of the saw-like teeth causes the stream to be doubled back on itself, as it were, and so obstruct the flow of the liquid behind it, with the effect that the resultant

flow is not so rapid as that from a nozzle without a wire.

Thus, with an increase of speed of the engine from any cause, there is an alteration of pressure in the air entering at *H*, or *vice versa*, and a corresponding amount of gasoline is sucked through *G*, but owing to the action of the wire in the nozzle, the violence of the suction is so tempered that only the exact quantity to produce a perfect mixture is emitted. The more violent the suction, the greater the retarding effect of the saw-like teeth, while at slower speeds, there being a less powerful suction, its delivery is proportionately greater. Hence, without a moving part, wear, or springs, a perfectly automatic action is obtained by a practically indestructible device. To put the matter in a nutshell, the automatic properties of the carbureter are due simply and solely to the eddy currents in the stream of gasoline caused by the interruptions by the serrated wire. This is the whole secret of the Dunlop carbureter. The gasoline issuing at *G* strikes against *J*, which, by the way, is the sole adjustment, and part of it falls on the gauze *J*, part is carried on to the gauze *L* direct, and the rest is scattered on the walls of the pipe, whence it travels to one or other of the gauzes, but whichever it goes to, the formation of either is such that it instantly presents the maximum amount to surface to the inrushing air and is instantaneously vaporized.

Front Drive—Front Steering.

Walter Christie, owner of the Christie Iron Works, New York, who has been interested in automobile subjects for some time, has devoted the past twelve months to the construction of two experimental gasoline cars which embody a number of constructional features that are entirely original—or new in this country at least.

The motor which drives Mr. Christie's latest car is mounted transversely in front, immediately behind which, and parallel to it, is the transmission mechanism, which is designed for two forward speeds and a reverse. In place of a flexibly jointed propeller shaft, as in the usual construction, there are two driving shafts, each provided with universal joints and sliding sleeves, extending in opposite directions to the hubs of the front wheels to which the power of the motor is thus communicated.

Instead of leaf springs, spiral springs are used in front. They are enclosed and mounted directly over the hubs. The hubs are hollow and designed to permit the use of steering pivots, the centers of which are in line with the vertical axes of the wheels.

The motor is of four-cylinder vertical type, rated at thirty-five horsepower, and controlled by a throttle and spark timing mechanism as in ordinary construction. The frame of the car is hung rather lower than usual.

The total weight of the car is only 1,250 pounds and it will be put on public exhibition during the week of the New York automobile show.

Meanwhile the makers consider it impolitic to make known the exact details of the construction, for the exploitation of which it is the intention to form a manufacturing company independent of the Christie Iron Works.

A car whose main features were similar to those of the Christie car was shown in Paris by two promising young constructors over a year ago, and depended for its success, it was stated, largely upon the excellent material and workmanship in the universal joints, which were of novel design.

Last Y. M. C. A. Discourse on Steam Cars.

The subject of the sixth and last lecture by Parker H. Kemble in the Boston Y. M. C. A. course on steam vehicles dealt with the commercial side of the problem. It was in part as follows:—

Long and intimate acquaintance with the horse has set a standard for the motor-propelled vehicle which is of itself a hard one to line up to. In considering the performance of a motor vehicle the average business man ignores the many little stops and delays of horse service, and unjustly magnifies the slightest delay for adjustment or fuel in the motor car. Commercial traffic can be divided into passenger, light freight, heavy freight and special service. For the present, the trolley will probably prevent any general use of the motor car for passenger transportation. For light freight the outlook is more encouraging. It is not until loads of two tons or over are reached, however, that the motor car, and the steam motor car in particular, comes into strong competition with the horse-drawn vehicle. As soon as the load begins to outgrow the draft power of a pair of horses the motor stands pre-eminent.

The speed of a team of truck horses varies from two to three miles an hour. The speed of a steam motor truck varies between five and six miles an hour. This speed is independent of the temperature, and the motor is not subject to heat prostration. The motor car also occupies much less space than the horse dray. A seven ton load with four horses occupies some forty feet of street, while a motor truck 23 feet long can handle the load comfortably. The motor can also be worked much harder. In one case where a record was kept, a four-ton steam truck easily did the work of two drays and four horses. Moreover, the motor car is much cleaner in the street than horses. The practical limit of one car is fourteen tons. For loads above that trailers have to be used, and these are not practical in the city.

The steam truck appears in many forms more abroad than in this country. There it is seen as the fire-engine, street sweeper, watering cart, mail wagon, truck, dump cart and traction engine. In connection with fire-engines, it may be of interest that the first auto fire truck was made in 1874 in Manchester, N. H., and was sent to New York. A few years later New York ordered four more, and after long service they were quietly retired. They seem to have done their work well.

One of the first questions in approaching the question of freight transportation by road truck is that of fuel. Just at present everything is gasoline, with no possibilities of kerosene. Crude oil has advantages as regards cost and convenience, but for commercial work in general, coal or coke offers the simplest and cheapest solution. The tire problem is another vital matter. The pneumatic is out of the question. High tractive efficiency, quiet in the streets and protection to the mechanism demand some resiliency. At present this means rubber in some form and with it, high cost and many repairs. In England a steel tire has been adopted and springs used to relieve the machinery. The steel tire would seem to be the correct solution for heavy vehicles.

As to comparative cost, the experience of an English railroad has shown that a steam rig of truck and trailer is cheaper than horses.

In the matter of steering heavy trucks, the fifth wheel as used on carriages seems preferable. The usual method of control is by rack and pinion. It is worth noting, however, that one firm has brought out a truck with hydraulic steering gear, the motion being controlled by two cylinders working under water pressure. It is a strange experience to step aboard one of the ponderous, slow-moving elephants and take control after handling a light runabout. They are so comparatively clumsy and take relatively so much more room than their smaller cousins, that, if the streets be crowded, the possibilities are many. There has been much speculation of late as to the possibilities of the auto in warfare. The results of various foreign manœuvres would seem to indicate that the traction engine was the only successful form. During the Boer war traction engines drawing one or more loaded wagons, were in constant use handling supplies for the troops in the field. The roads were mere bullock tracks and even near the larger towns it was no unusual thing for the big lumbering engines to haul one another out of ditches and mud holes.

A Canastota automobilist is threatened with suit for running over and killing a Oneida man's dog, said to be worth 25 cents when alive but which its owner now values at $25, which substantiates the popular saying with some that "a dead cur is worth more than a live one."—*Binghamton (N.Y.) Herald.*

COMPETITORS FOR CUP RACE FROM MANY LANDS

Elimination Trials Occupy the Attention of Teams Announced from France, Germany, Belgium and Italy.

AMERICAN TESTS TO BE HELD ON TRACK.

The international committee representing challenging automobile clubs has named Friday, June 17, as the day and date for the Gordon Bennett Cup Race, which, as previously decided, will be run over the Limburg-Saalburg course in Germany. A desire to secure the attendance of the German Emperor at the race decided the committee to name an earlier date for the event than was at first intended.

Although not definitely decided it is the general impression in automobile circles in this country that the Automobile Club of America will hold its eliminating trials on May 1, so that the successful candidates for competition in the German race would have six weeks in which to cross the ocean and make preparations for the contest. Until after these eliminating trials it will be impossible to name the members of the American team as finally selected, because the three cars now entered will have to prove their right to a place on the challenging team, under the supervision of the racing committee of the A. C. A., before they will be selected to meet the finest product of the foreign automobile manufacturers. The committee is still undecided as to the best course for these eliminating trials. The speed trials will probably be held on a track, owing to the difficulty of securing speed privileges on the highway, while hill climbing and endurance tests will be made on the road.

In Europe it will not be particularly difficult to select a course for the eliminating trials and the Continental manufacturers, at least, will probably take advantage of the Circuit de Ardennes race, in Belgium, to test out their cars. This race will take place about one month before the Gordon Bennett contest. The entry fee for the Circuit de Ardennes is $200. Drivers of automobiles are assessed $100 each, while training over the course, and $80 is returnable if they meet with no accidents. The other $20 is given to the villages along the route. The training hours have been set from 8 o'clock in the morning until 11, and in the afternoon from 2 to 4.

The Darracq company has entered three 80-horsepower racing cars for the French eliminating trials, and Panhard & Levassor, De Dietrich, Clement and Bayard are candidates on the preliminary team. In addition to Wolseley and Napier cars, the English committee will try out a car entered by J. E. Hutton for a place on the challenge team. This car, which is not yet on the market, has six vertical cylinders and the whole construction is very light in weight. The Automobile Club of Switzerland has entered for the International race, and it is supposed that the competing cars will be made by Martini, the celebrated gun manufacturer. The Italian team will use F. I. A. T. cars exclusively. These will be driven by Mr. Lancia, who is chief of the F. I. A. T. testing department; Cagno, once chauffeur for the Duc de Abruzzi, the well-known "sporting duke" and explorer, and Storero, who is the Turin agent for the F. I. A. T. company. Germany will be represented by Mercedes cars, and it is reported that Clarence G. Dinsmore's car, which won the Gordon Bennett race last year, will compete again this season.

The American challengers have not named their drivers as yet, although Barney Oldfield's name heads the list of possibilities. It is thought that his business connections will prevent him from driving the Peerless car, even if he were invited, which seems probable, as he recently took a drive with Mr. Mooers and expressed himself as satisfied that the remodeled Peerless racer is very fast, and showed much interest in the new car now building.

It was fully expected that the Winton company would enter a car for the race, and much disappointment was felt when it was found that Mr. Winton's name did not appear on the entry list. The fact that the Winton company did not see fit to enter, in view of its previous trials to win international honors, has created considerable comment in Cleveland, and while the officers of the company have little to say on the subject, it is understood that Mr. Winton felt, in view of his past record, and his previous interest in the Gordon Bennett cup, that he might have been especially invited to enter a car as a member of the American team. There is little doubt that had such an invitation been extended, a Winton car would have been built for the race.

TRADE ASSOCIATION IN NEW YORK WILL ABANDON SECRECY.

The New York Automobile Trade Association held a meeting on Tuesday of this week to hear the report of a special committee on constitution and by-laws, which was appointed some time ago. The committee reported in favor of abandoning the sessions of the executive committee and throwing all meetings open to members for the discussion of business related to the association. It is expected that the recommendations of the special committee which were adopted, will stimulate enthusiasm among the members of the organization.

Cars Delivered Under Own Power.

It has been found quicker and cheaper to deliver motor cars under their own power than to ship by train to points within a reasonable distance, even in winter weather. A spectacular feature of the October Endurance Run was the fact that the automobiles got through from point to point when the railroad trains were unable to run, and a number of instances have come to the attention of the Knox Automobile Company of Springfield, Mass., in which even in ordinary weather the automobile is quicker and more dependable than the railroads.

Trade Notes.

The Central Automobile Company's big garage at 1684 Broadway, New York, narrowly escaped destruction or great damage by fire last Saturday. The fire started in a kitchen of the Lyceum Theatre building, the ground floor of which is occupied by the garage, and great concern was felt on account of the presence of a considerable quantity of gasoline stored in the basement under the sidewalk. More than 100 valuable foreign and American touring cars were run out of the garage into the street and removed to places of safety. Most of the fire engines and hose carts on the West Side of the city north of Twenty-third Street were called out and filled the streets for blocks around the scene of danger and excitement.

The Ralph Temple & Austrian Co., Chicago, is having a building erected on Michigan Avenue for its automobile headquarters which will be fully equipped for conducting an extensive agency and repair business. Two fifteen-foot elevators will connect the different floors The building has a seventy-eight foot frontage on Michagan Avenue and is located opposite the Logan Monument, in the Lake Front Park, and south of the Auditorium Hotel. The front of the structure will be finished in white terra cotta, and large plate glass windows will afford ample display advantages.

A. J. Picard, well known as a starter at many of the race meets of the past season, and heretofore representing the interests of the United States Steel Corporation in the automobile industry, has associated himself with F. A. La Roche in the latter's business as importer of Darracq cars.

The New York branch of the Winton Motor Carriage Co., of Cleveland, moved into its new Eastern headquarters at Broadway and Fifty-fourth Street on Tuesday, December 29.

The motor Car Company of New Jersey, will move into its new building at 291 and 293 Halsey Street, Newark, by February 15.

Will the gentleman who stole Mr. E. H. Butler's automobile kindly leave the same in front of Mr. W. C. Warren's office? We have it on the highest authority that Mr. Butler does not suspect anybody as yet, and that would help some.—*Buffalo Times.*

The Droll Parisian Octroy.

PARIS, Dec. 12.—American motorists, and especially New Yorkers, are fortunate in having no personal and daily encounters with the tiresome formalities connected with the Parisian *octroi* and *sortie d'essence*.

MEASURING THE TANK.

FIGURING THE CAPACITY.

The excise duty imposed upon the importation of gasoline into the City of Paris is rather high—20 centimes per liter or about 4 cents per quart—and the collection of it subjects Paris motorists who leave the city, merely to return later in the day, to much vexation. When leaving they must declare the number of liters which they carry, and on their return they must prove that they do not take a larger quantity back, or they must pay duty on the excess. And to this end the gasoline in the tank must be measured, which means that the dimensions of the tank must be measured to know how much it will hold. The calculations involved herein give rise to a good many protests and delays, and hence there has latterly been made an effort to change these things somewhat. The director of the octroy, M. Quennec; delegates from the Automobile Club de France and the Touring Club de France, from automobile manufacturers' associations, among whom MM. de Dion and Max Richard, and many of the Paris aldermen, have come together to try to remove some of the most carmine-hued tape in the present order of things. After long discussions upon new rules for measuring, tanks of special design, commutation gasoline tickets and similar expedients, it was decided to commence by simplifying the calculations by means of improved measuring instruments; but, on the other hand, to subject all cars, without exception, to the scrutiny, while heretofore in most cases reliance was placed in the good faith of the chauffeurs.

Some of the tribulations that the Parisian motorist is condemned to undergo may amuse the readers of THE AUTOMOBILE.

A car arrives at one of the entrances of the *banlieue*, or excise boundary. Without any particular reason the excise officer hurries up to inspect it, although he has allowed a number of others to pass on their say-so, probably because the faces of the drivers pleased him better. As it happens the newcomer has lost his *sortie* and it becomes absolutely necessary to find out the exact contents of his gasoline tank. The operation is begun by plunging the inch-rule into the gasoline; then the measurements of the tanks are taken. So far everything is easy. But when it comes to the calculation of the contents difficulties arise. The tank is of special shape; it contains a compartment for lubricating oil. After wrestling with the problem for five minutes the officer is obliged to call upon a colleague for assistance. The latter has no better luck. A *brigadier* is required and finally succeeds in getting all to agree to an approximate calculation. Meanwhile the chauffeur has found an old *sortie* for five litres which he waves triumphantly, and as the calculation charges him with 5 1-2 liters only, he is allowed to pass to the cashier to pay ten centimes (two cents) for the tax, plus twenty centimes for the revenue stamp.

AT THE CASHIER'S DESK.

IT TAKES TWO TO FIGURE IT OUT—SOMETIMES THREE.

The new system is intended to relieve the excise employes of their excessive brainwork, but will hardly result in much economizing of the time and patience of motorists, and it is hoped that the future may have something more practical in store.

PAUL DOYÉ.

A Million Guesses for An Automobile.

BOSTON, Dec. 25.—A guessing contest for a Thomas touring car, which has been conducted for the past two months by the Boston *Traveler*, ended a few days ago and the result was announced last Wednesday. The winner of the machine is John G Wolcott, the thirteen-year-old son of Dr. J. C. Wolcott of Cambridge. The prize was to go to the person who turned in the most guesses of the number of advertisements in the paper for a given time. Young Wolcott turned in nearly 25,000 guesses and struck the right number, 13,618, sixty times. More than 1,000,000 guess coupons were turned in by 25,000 different persons. During the time the contest was going on the automobile was driven about the streets of the city and its suburbs and attracted much attention. The machine was secured from C. S. Henshaw, local representative of the makers.

The development of certain novel automatic features of control designed to relieve the operator of much of the vigilance usually bestowed upon cars of similar type when on the road, has been the leading aim of the Electric Vehicle Company in its new light gasoline tonneau, which will be known as Columbia Mark XLIII. This machine, which will make its first appearance in public at the New York show, has a double-opposed cylinder motor developing 12 to 14 horsepower located under a forward bonnet, bevel gear drive, sliding gear transmission giving three forward speeds, and a foot-operated friction clutch.

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SATURDAY, JANUARY 2, 1904.

SOME NEW YEAR THOUGHTS.

On the surface of things, the New York show with its promise of sensations and surprises, more or less genuine and more or less important, appears at present to constitute the subject most prominent in the minds of the automobile industry and trade. It will solve some doubts unquestionably, and raise new ones, but perhaps it will be to the general public more interesting in the anticipation of what it will bring forth than in the realization. Such at least seems to have been the result in regard to the Paris show. The most significant changes in motor vehicle design no longer relate to the features which may be appreciated at a glance.

Among lovers of automobile sport, the three days of Ormond-Daytona Beach races crave attention, as well they may, since no reason is known why they should not prove an enjoyable and even gorgeous affair of their kind, though perhaps more exclusively confined to amateur circles than if they were not interpolated between the New York and Chicago shows, allowing only scant time for business men in which to make connections. It is to be hoped that popular attendance and enthusiasm will suffice to establish a precedent of success that may insure the repetition of the event in 1905 and following years when there should be no real difficulties in making it one of the international episodes that tie nations together and make for industrial progress and also for cosmopolitan forms of living and thinking.

Gratifying life has been infused in the Good Roads movement and efforts in this direction occupy the local automobile clubs as well as national associations, while interesting skirmishes between the latter portend great activity in association work for the opening year.

The A. L. A. M. also manages to keep in the center of the stage, now by announcing that no more suits to uphold the Selden patent will be instituted against American manufacturers, agents or motor car owners, for the present, and again by attacking a large French firm in protection of one of its own licensed importers.

On the surface of things, all of these matters reflect the activities that are stirring the automobile world, but the factors which make automobile history are found lower down and farther removed from the gaze of the curious. Often they are veiled in frivolous togs so that they may earn support while in the stages of evolution. Such a factor, highly composite in character, is the tendency to create automobiles which are not only equal to, but greatly superior to their work. Overpowered cars designed ostensibly for the flippant pursuits of rapid hill-climbing, dizzy racing speeds and law-breaking on the highways, have made conservative persons wonder if automobilism is running to seed in the excesses of its speed possibilities. The author of the epigram: "Nothing succeeds like excess," might have pointed to automobiles for seeming confirmation of his cynicism. But either we "build better than we know," or the designers of overpowered cars have been well aware that there was urgent necessity for developing the safe and reliable high-powered multicylinder gasoline motor for entirely different purposes than those which they have usually been made to serve so far. Speed capacity being transmutable into power for hauling loads, as soon as the power plant was rendered flexible and obedient, the mammoth four-cylinder motor of upward of a hundred horsepower installed in speed cars was the unavoidable precursor of the engine required for omnibuses, drays and all forms of gasoline motor vehicles intended for the transportation of loads.

It cropped out in the French newspaper reports of the recent hill-climbing trials at Gaillon that more sincere admiration was bestowed upon the De Dietrich omnibus which climbed the kilometre with a dozen passengers aboard in 2.3 minutes, than upon the stripped machines which covered the same course in one-third the time.

Knowing that load transportation by mechanical means is necessarily the largest ultimate object to which the automobile industry must be devoted, observers of our automobile development have often had reason to smile a little superciliously at the cheap satisfaction derived from hill-climbing feats in our various contests. The mere ascending of a fairly steep grade without stops was considered a victory, though it was evident that no margin of power was left for handling an increased load if necessary. And for a considerable period, heavy imported cars were among the most deficient in this respect. The cars were equal to their work as pleasure vehicles, so far as power was concerned, but not more, and he who contemplated them with a view to what they promised in the field of general utility, received the impression that the gasoline motor and load transportation were incompatible terms.

The advent of the giant motor, comparatively light of weight, as it is, and rendered economical by the automatic carbureter even when operated much below its potential capacity, is doing great things in removing the first erroneous impression referred to, and paving the way for a rapid development of the gasoline motor business vehicle, farm wagon, etc. Manufacturers who have entered upon the production of multicylinder, high-powered motors for touring cars will find themselves directly in the line of succession to a bigger business, as soon as something shall have been done to convince the commercial world that the great machines which represent the highest type of luxury and sport, contain also all the essential features which, by mere gear changes, can be adapted to severe transportation work.

It was an anxious inquiry from a maker of component parts which made it seem desirable to dwell here upon this phase of the present situation. He desired to obtain data which would indicate to what extent the American market for high-powered touring cars had already been supplied or was in the way to be supplied through manufacture planned for the next few months. He had his doubts as to the stability of the demand for the large cars and desired to gauge his production of parts according to what he could learn.

As it happens that this line of inquiry must be of interest in wider circles, it seems gratifying to note that any diminution in the demand for large and costly pleasure cars—for which we do not look as yet, however—would in all probability result in much enhanced activity in the demand for business vehicles.

CARS SUPERIOR TO VARIANTS.

While speaking of the factors below the surface to which it may be well to devote a thinking effort now and then, the superabundance of power in the costliest types of modern cars suggests other points tending to establish the automobile on a firmer footing than ever before occupied.

As power surplus lifts the car to independence of variations in load and gradients, the amplification of motor control which means the simplification of car control, and which has been the keynote to the best efforts of constructors during the past year, largely overcomes variations in the abilities of drivers; and improvements of the carbureter further make the car rise superior to variations of weather, temperature and quality of fuel. One by one the troublesome variable factors have been subdued. And it seems to be a remark worth making—if it does take the form of a glittering generality—that cars take rank for quality accordingly as their construction renders them more or less superior to just those external variable factors mentioned. Even the factor of wear and tear may be considered under this head, since it introduces difficulties in operation not contemplated in the original construction. And this, the most stubborn, but also most excusable, enemy of good work, is yielding slowly to the steady improvement in materials and in the selection of materials. In the carbureter, particularly, the wear resulting from moving parts, has played pranks with the patience of the public, because the elusive properties of the gases handled in this important organ turned the slightest imperfection into considerable loss of motor power and into ignition troubles which at times seemed inexplicable Automatic carbureters, free from moving parts appear from this point of view as among the most important features in modern cars, especially as they usually lend themselves readily to use with high-speed multicylinder motors.

SECOND LARGEST CLUB IN NEW YORK JOINS NATIONAL BODY.

The Automobile Club of Buffalo has made application through its president and secretary for club membership, and for membership for the club members as individuals, in the American Automobile Association. The Buffalo club is one of the largest organizations of automobilists in the United States, and only the Automobile Club of American has brought more members into the national association.

The police are in possession of a fine derby hat. They are not concealing their anxiety to find the owner of the headpiece. One second before, a huge red automobile, smelling like a distillery and snorting like a Corliss engine, had dashed past at 50 miles an hour. The hat blew from the chauffeur's head. If he seeks his property he will be closely questioned regarding the violation of the speed ordinance.—*Columbus (O.) Journal.*

Three Pipe cars—a make favorably mentioned during the past year—will represent Belgium in the Bennett Cup race.

MASSACHUSETTS SLOW TO JOIN IN CLUB FEDERATION.

Boston Dealers Will Not Declare Preference as Between the A. A. A. and Potter's League.

LEADING CLUB SUFFICIENT UNTO ITSELF.

BOSTON, Mass., Dec. 28.—The first setback which the American Automobile Association has received in its campaign of organization in Massachusetts was administered last week by the Boston Automobile Dealers' Association. When the original meeting to talk over the project was called some weeks ago by President Chase and Secretary Gillette of the A. A. A., the Dealers' Association was represented by Vice-President Eldridge. At the meeting of the Dealers' Association the proposition of affiliating with the clubs of the State in the formation of a Massachusetts State Automobile Association was brought up and after some discussion it was decided that it was for the best interests of the local organization to remain neutral and not to join in the A. A. A. movement. Secretary Campbell was instructed to write to Secretary Gillette and notify him of the action of the Boston Association. The members of the Association, as individuals, are in favor of a national organization, some of them favoring the A. A. A. and others the American Motor League, but as dealers they do not wish to commit themselves.

What action the other organizations represented at the meeting called by Secretary Gillette have taken in the matter is unknown, but the Massachusetts Automobile Club does not appear to be extremely anxious to go into a State organization. The matter is in the hands of a committee whose decision is not yet public. A meeting of the representatives of the clubs with President Case and Secretary Gillette has been suggested for an early date, and at that time the movement will either go ahead or perish. Since the first meeting Secretary Gillette has prepared a constitution and by-laws for the State Association and has forwarded them to the clubs interested.

The action of the A. A. A. toward the formation of a Massachusetts branch has stirred up the American Motor League, and a large amount of its literature has been circulated among automobile dealers and owners of the State. Several prominent dealers of this city have received invitations to become consuls of the League, and a number of club members have been urged to identify themselves with the work of the organization. They have also been urged to attend the League meeting which is to be held in New York during the show.

Rockford Automobile Club Organized.

The Rockford Automobile Club of Rockford, Ill., was formally organized last week at a meeting of many of Rockford's prominent automobile owners, at which a constitution and by-laws were adopted and officers elected as follows:

President, G. L. Woodruff; vice-president, A. W. Church; secretary, H. W. Dickerman; treasurer, George Scott; directors, Dwight Cutler, Fritz Ulrici, G. L. Woodruff, A. W. Church, H. W. Dickerman.

The principal objects set forth in the constitution are to protect all automobile owners from stringent and unjust legislation, to compel drivers of all vehicles to observe the speed laws, and to help the movement to secure road improvement. The initiation fee and annual dues are fixed at $5 each.

President Woodruff, speaking of the outlook of the new club, said: "There are now fifty machines in Rockford and many persons who can operate a machine, who are interested in the welfare of the auto, and it is only proper that we should organize into an association; in fact, this club is not only an automobile club; we want to build up the social end of the club and hope that this organization will be the nucleus of a big club. We also hope to erect a handsome clubhouse of our own somewhere in this city. There is no doubt that in a few years the number of automobiles in this city will have increased considerably and will lend this organization more prestige in its efforts to secure improvements and proper legislation."

INCORPORATION PAPERS FILED IN ALBANY BY THE N. Y. S. A. A.

ALBANY, Dec. 28.—Certificate of incorporation of the New York State Automobile Association was filed to-day with the Secretary of State. The stated objects of the organization are "To conduct a social and protective organization of all persons resident within the State of New York who own or are interested in motor pleasure vehicles, whether as members of clubs or not; to coöperate in securing rational legislation and the enactment and enforcement of proper laws, ordinances, rules and regulations governing the use of such vehicles in such State; to protect the interests of owners and users of motor pleasure vehicles against unjust or unreasonable legislation in such State; to promote and encourage the maintenance and construction of good roads, and, generally, to maintain the rights and privileges of all persons who own or are interested in such vehicles, through some national association with which such corporation shall become affiliated."

The principal office is to be at Syracuse, but may later be anywhere at the option of the directors.

The directors for the first year are: Emerson Brooke, 513 Seventh Avenue, New York; A. R. Pardington, 81 Willoughby Street, Brooklyn; Charles M. Page, 158 Liberty Street Albany; A. J.

Baechle, 321 Genesee Street, Utica; Frederick H. Elliott, 512 East Water Street, Syracuse; Selah C. Tallman, Auburn; Harry S. Woodworth, 69 Main Street W., Rochester; William H. Hotchkiss, 700 D S Morgan Building Buffalo; Augustus H. Knoll, Mooney Building, Buffalo; Hurlbut W. Smith, 701 E. Washington Street, Syracuse, and Oliver A. Quayle, Albany

SPEEDWAY FROM LOS ANGELES TO THE SEA PLANNED BY CLUB MEN.

Los Angeles, Dec. 24.—The unqualified success of the automobile race meet given here recently by the Automobile Club of Southern California has revived interest in a projected boulevard from Los Angeles to the Pacific Ocean which would be suitable and safe for automobile speeding.

Plans for such a driveway and the means to be adopted to secure its construction were outlined in a report delivered by Frank A. Garbutt to the board of governors of the automobile club in behalf of the committee on contests and runs. Mr. Garbutt took a decided stand in favor of building the speedway which would serve as a stimulating example for the construction of other good roads. The club members stand as a unit in favor of the drive.

The club is now financially able to start an undertaking of this kind, and it is pledged to the furtherance of automobiling throughout Southern California and to good roads especially.

The proposed speedway would extend from Los Angeles to Playa Del Rey, which is about the shortest cut to the ocean, being about sixteen miles, and the idea is to have a road that will be second to none in the country for automobiling. Ocean Park and Santa Monica would be easily accessible from Del Rey by the speedway that extends along the ocean front. The club is promised title to a strip of land three miles long and 100 feet wide, which is almost straight and very level, and three miles more could be purchased for $3,000 or $4,000, making six miles without a turn. Gravel for surfacing has also been offered, and, with the resources at the command of the club, a road to the sea could be built that would be a great attraction to automobilists and for users of pleasure carriages of all kinds.

New Quarters for Troy Club After Fire.

Troy, N. Y., Dec. 28.—The quarters of the Automobile Club of Troy in the Cronin Building were ruined last week Tuesday by a fire that burned off the whole top of the building and caused much damage to the rest by smoke and water. The members had no machines in the building, in which they had merely a meeting room. The club has secured new headquarters in the Hall Building, and at a special meeting held last Wednesday night a committee was appointed to secure a building or room suitable for a club garage, to be occupied at once. At the same meeting President Alonzo McConihe was elected a member of the board of directors of the New York State Automobile Association.

American and Foreign Automobile Fixtures for the Winter.

1 03
Dec. 10-25.—Sixth Annual International Exposition of Automobiles and Cycles in Paris. Grand Palais. Automobile Club of France.
Dec. 31.—Closure of Entries for 1904 Gordon-Bennett Race.
1 904
Jan. 16-23.—Fourth Annual Automobile Show, New York, Madison Square Garden. National Association of Automobile Manufacturers, Madison Square Garden Company and Automobile Club of America.
Jan. 21.—Annual Meeting of National Association of Automobile Manufacturers, Madison Square Garden.
Jan. 22.—Annual Banquet of National Association of Automobile Manufacturers, Café Martin, New York.
Jan. 16-30.—Automobile Show. Herald Square Exhibition Hall, New York. Alfred Chasseaud, Manager.
Jan. 23-Feb. 4.—International Automobile Exhibition at Brussels.
Jan. 26-30.—Philadelphia Automobile Show. Automobile Club of Philadelphia and Automobile Dealers' Association of Philadelphia.
Jan. 25-Feb. 6.—Racing Tournament at Daytona, Fla. Ormond-Daytona Sea Beach. Florida East Coast Automobile Association.
Feb. 6-13.—Fourth Annual Automobile Exhibition, Chicago. Coliseum Building. National Association of Automobile Manufacturers and Chicago Automobile Club.
Feb. 6-13.—Annual Meeting and Election of American Automobile Association, at Chicago.
Feb. 8-20.—National Motor Boat Exposition. Herald Square Exhibition Hall, New York. Dr. Robert Taylor, Director.
Feb. 12-24.—Second Annual Automobile Exhibition. Crystal Palace, London. Society of Motor Manufacturers and Traders.
Feb. 15-20.—Third Annual Exhibition at Detroit. Detroit Light Guard Armory. Tri-State Automobile and Sporting Goods Association.
Feb. 29-Mar. 5.—Cleveland Automobile Show. The Grays Armory, Cleveland Automobile Club.
Mar. 6-12.—Second Annual Buffalo Automobile Show. Convention Hall, Buffalo. Automobile Trade Association and Automobile Club of Buffalo.
Mar. 14-19.—Third Annual Automobile Show, Boston. Symphony Hall. Boston Automobile Dealers Association.
Mar. 17.—Start of Touring Trials Paris to Rome, organized by La France Automobile.
Mar. 19-26.—Motor Car Exhibition, London. Agricultural Hall. Cordingly & Co.
Mar. 20.—Opening of Automobile Festival at Nice, France.
Mar. 21-26.—Fourth Annual Washington Automobile Show. Washington Light Infantry Armory. Washington Automobile Dealers' Association.

PHYSICIANS' AUTO CLUB OF NEW JERSEY TO BE EXCLUSIVE.

Newark, Dec. 28.—Only doctors of the State of New Jersey who own automobiles are eligible to membership in the Physicians' Automobile Club of New Jersey, which was organized here last week at a meeting that was well attended by physicians who have had the formation of such a club under consideration for some time. At a second meeting held last Tuesday a constitution and by-laws was adopted. More than twenty physicians have already signed the membership roll.

The club has been organized for social purposes only and will have no affiliation with other clubs. It is said to be the only one of its kind in existence, although the Bronx Automobile Club of New York, is composed almost if not entirely of doctors. It is the intention of the organizers of the new club that at each meeting the members will discuss subjects pertaining to the automobile and its use, and that these discussions will be attended by experts who will take part in them and assist the members in learning how to operate their cars so as to get the most out of them in the way of service and pleasure. The club also hopes to secure the benefit of reductions of prices on supplies and sundries by making purchases in quantity. The club may arrange for a club garage and employ a machinist.

The officers elected are as follows: President, Dr. Edward L. Burns, Newark; vice-president, Dr. William H. Bull, Glen Ridge; secretary, Dr. Clement Morris, Newark, and treasurer, Dr. M. Z. Westervelt, Newark.

The New Jersey Automobile and Motor Club has decided to support one of its members, Jacob W. Mason, in appealing from a jury decision holding him accountable in the sum of $50, for damages to the horse and wagon owned by a Huntingdon County man, who, as joint plaintiff with his wife, alleged that the defendant's automobile caused the animal to run away last summer.

This was the first jury decision under the new State automobile law, and motorists fear that the result will cause many similar suits. If the club's lawyer thinks there are grounds to sustain an appeal, the case will be carried to a higher court, as prime objects of the organization are the protection of its members against prosecution and persecution and the establishment of the rights of automobilists to the use of the public highways.

The New Jersey Automobile and Motor Club was organized in Newark less than a year ago and now numbers 127 members, as the result of a strong effort made by the officers to boom the membership.

Henry Pontius has purchased an Olds automobile which he will use in getting around over the country to buy hogs. Henry is strictly up-to-date and figures that he can save time and expense by substituting this method of locomotion.—*Valley Falls (Kan.) New Era.*

That Augusta is up to date in the farming line, is demonstrated by the fact that Mr. George Childs has been hauling his fodder with an automobile.—*Richmond (Va.) Despatch.*

PANHARD IMPORTERS SUED BY THE LICENSED ASSOCIATION.

Contributory Infringement of Selden Patent Alleged and Injunction Sought Against Importation and Sale Here.

QUICK LEGAL PROCEDURE PROBABLE.

The Licensed Association of Automobile Manufacturers filed a suit for contributory infringement of the Selden patent against Panhard & Levassor of France, and André Massenat of New York, manager of the American branch of the French company, on December 28, enjoining the parties mentioned from importing and selling Panhard cars in this country. The suit will be tried in the United States Circuit Court, Southern District of New York.

Mr. Massenat made the announcement some time ago that he intended to confine himself to the importation of Panhard motors for boats and repair parts for cars. The Licensed Association states that Mr. Massenat has sold completed Panhard cars in the American market and thereby infringed on the rights conferred by the Association to its importing licensees.

The suit is perhaps of greatest interest to the public on account of the quicker procedure which obtains in the United States Courts in suits against foreigners as compared with purely domestic law suits.

Additional Space at New York Show.

Accommodation for fifteen additional exhibitors who have been waiting to be assigned space at the Madison Square Garden Show, has been provided by utilizing the upper tier of boxes. This brings the total list of exhibitors up to 170.

The Mack Brothers Company of Brooklyn, has asked for special accommodation for its new fifteen-passenger automobile, which is built along the same lines as a touring car, with three cross or surrey seats, each seating three people and a large tonneau accommodating six passengers. It is equipped with a four-cylinder gasoline engine.

Another novelty to be shown is the product of the Caldwell Lawn Mower Company of Newburg, N. Y. It is a steam lawn mower that cuts a swath of forty inches and is equipped with a steam boiler and engine supplying eight horsepower. The machine can be used as a mower or a roller. It weighs complete about 3,000 pounds.

Buffalo Show Space Going Rapidly.

BUFFALO, Dec. 27.—A committee to handle the Second Annual Buffalo Automobile Show, to be held in Convention Hall, March 7 to 12, has been selected and began its work by securing two practical automobile enthusiasts to have direct management of the show. The committee is composed of A. H. Knoll, chairman; Charles Clifton, E. R. Thomas, John Gibson and D. H. Lewis; and the men selected to manage the affair are Fred J. Wagner, secretary of the Automobile Club of Buffalo, and Dia H. Lewis, secretary of the Buffalo Automobile Trade Association. The managers began their work Thursday morning. In just three days forty-five spaces for exhibits were taken by local manufacturers and dealers. This exceeds all the exhibits at the previous show, so that the coming one is an assured success. All the available space will be taken. The following cars and concerns have already been assigned space:

Pierce, Thomas, Cadillac, Centaur, Packard, Franklin, Rambler, National electric, Crestmobile, Stevens-Duryea, Duquesne, Locomobile, Ford, Toledo, Waverley electric, Winton, Olds, Peerless, Apperson Bros., White steamer, Haynes-Apperson, National Battery Co., Northern, Autocar, O. K. Machine Co., Buffalo Gasoline Motor Co., 20th Century Lamp Co., Badger Brass Mfg. Co., Ripper, Reliance, Santos-Dumont, Sintz and St. Louis.

Hyatt Banquet During New York Show.

The second annual banquet of the Hyatt Roller Bearing Company to its friends will be held in the newly-opened Bretton Hall Hotel on Broadway, New York, between 85th and 86th streets, during the week of the New York show. The entire ground floor of the southern wing, comprising the banquet room, the lounge room and smaller adjoining rooms have been reserved for the occasion and invitations have been issued to nearly 200 of the company's friends in the automobile trade and in many other of the largest industries in the country. Representative men will be in attendance from Cleveland, Detroit, Cincinnati, Chicago and Minneapolis. Arrangements have been made to have enough electric cabs and buses at the door of Madison Square Garden to convey all guests to the hotel.

Col. A. A. Pope has consented to deliver an address after the dinner and a vaudeville entertainment by the best obtainable talent will follow. The affair is intended to be an informal one.

New Cleveland Garage Company.

CLEVELAND, Dec. 28.—Plans for new automobile garages for Cleveland are developing at a rapid rate. The latest to announce its intention is the Chisholm-Philips Automobilium Company, which has been incorporated by Henry Chisholm of the Champion Rivet Company, and Frank Philips of the Philips Carriage Company, together with several prominent automobilists whose names will not appear in the management of the company. The capital stock of the company is $50,000. As soon as possible, work will start on a new garage which will cost about that figure. The building will be located on Euclid Avenue opposite Olive Street, which is about two miles from the downtown district and well situated to attract the repair and storage business of East Enders. The site is 65 x 100 feet and the building will be 50 x 100 feet. It will be three stories high, and the promoters maintain that they will have the finest automobile establishment in the State. The company will have the local agency for the Peerless car.

"Automobilium," which appears in its title, is a brand new word which is claimed to be original with the incorporators of the company. It is meant to convey the idea that the Euclid Avenue establishment will handle everything that an automobilist may require. The new concern will take over the business of the Frank Philips Carriage Company, of which Mr. Philips is the head, which has for some time been carrying on an extensive finishing, upholstering and automobile repairing business.

Recent Incorporations.

Standard Automobile Company, incorporated at Harrisburg, Pa.; capital stock, $75,000. Treasurer, Robert R. Gordon, Pittsburg; directors, W. N. Murray, Allegheny; Robert Pitcairn, Jr., Robert R. Gordon, F. C. Perkins, R. S. Robb, Pittsburg.

American Automobile & Power Company organized at Sanford, Me.; capital stock, $500,000; $50,000 paid in. President, Ernest M. Goodall of Sanford; treasurer, Henry C. Long of Boston; other directors, Chester I. Campbell and Samuel E. Ward of Boston.

Commercial Automobile Company, New York; capital, $2,000. Directors, O. J. Hershmann, New York; Frederick Werner, Brooklyn, and Anderson Price, Rutherford, N. J.

Chisholm-Philips Automobilium Company, of Cleveland, Ohio; capital stock, $50,000. Incorporators, Henry Chisholm, Frank W. Philips, Benjamin Parmely, Jr., J. Hogan and Zeta Rose.

Marion Motor Cycle Company, of Indianapolis, capital stock, $50,000; to manufacture gasoline automobiles. Directors, Charles A. Bookwalter, Frederick A. Joss, Robert H. Hassler, J. Arthur Hittle and J. G. Belser.

Maine Motor Carriage Company, Portland, Me.; to make and deal in carriages of all kinds; capital, $10,000; $900 paid in. President, A. W. Coombs; treasurer, A. W. Coombs; clerk, C. H. Tolman, all of Portland, and S. I. Gould.

Crescent Automobile Company, Jersey City; capital, $50,000. Incorporators Theodore F. Merseles, Louise J. Blakeslee and Edith E. Downes.

Detroit Automobile Top Co., to manufacture and sell tops and cushions for automobiles, buggies, etc., and for general repairing of vehicles; capital stock, $5,000. $4,000 cash paid in. John Andre, Charles Ritter, John Kohler and Joseph F. Dederich are the stockholders.

News Notes and Trade Items.

The Cadillac Automobile Company is building an entirely new and costly car to be exhibited at the shows together with five others.

The Angier Company, 43 Columbus Avenue, Boston, has been appointed northeastern agent for Continental tires and carries in stock a full line of lamps, horns and accessories.

R. Drisko, formerly New England agent for the Reber gasoline cars, has opened a Boston salesroom at 45 Columbus Avenue and will represent the Waltercar and also the Clement cars in New England.

Four or five automobiles for rental purposes are to be taken to Florida for use at Daytona and Ormond during the rest of the winter, if arrangements being made by Frank Ourish, of Boston, are carried out.

An elaborate automobile road map of Eastern New York State and the Berkshire Hills section of Western Massachusetts has been prepared by Courtland F. Bishop, and hung on the wall of the Lenox (Mass.) Automobile Station.

Snow plows have been fitted to several Rambler cars at the Kenosha factory of the Thos. B. Jeffery Company and are being used experimentally for clearing the testing track. They have proved very successful.

W. D. Gash, for several years manager for the Waltham Manufacturing Company and latterly for the Searchmont Automobile Company, has been placed in charge of the New York and Philadelphia automobile stores of John Wanamaker.

Two of the new electric express wagons of the Adams Express Company in New York have been equipped with Edison nickel-iron batteries, each wagon having sixty-six cells which are expected to give the vehicles a radius of forty miles on one charge.

The Queen City Automobile Exchange Co., which conducts the largest gasoline car storage station in Buffalo, and deals in and repairs machines, will handle the Orient Buckboard for 1904 and also have the selling agency for the White steam touring car.

The automobile salesroom and repair shop of Eugene B. Dye, in Louisville, Ky., has been removed from 220 First Street to 138 Main Street, where he conducts a wholesale paper and twine business. A floor space 30x90 feet will be devoted to the display of cars during the coming year.

The Bates Automobile Company of Lansing, Mich., has leased the old armory building in Lansing, formerly occupied by the Oviatt Wagon Company, and will manufacture a gasoline touring car designed by M. F. Bates of the Bates & Edmonds Motor Company.

It is reported that Oscar Clifford and Victor L. Emerson, of the Emerson Motor Yacht Construction Company, of Cincinnati, O., will make investigation in Baltimore regarding a site for a plant to be used in the manufacture of yachts, motors and automobiles.

An automobile stage and express line between Yellowstone Park and Cody, in northern Wyoming, is projected by W. F. Cody, "Buffalo Bill," in connection with large development schemes for the Big Horn Basin for the carrying out of which the erstwhile showman has raised $3,500,000 capital.

A meeting of the New York and Chicago Road Association will be held in Erie, Pa., on March 16 and 17, by invitation of the Chamber of Commerce of that city after a conference between Col. W. L. Dickinson, vice-president of the Road Association, and President Hamilton and the Board of Directors of the Chamber of Commerce.

It is denied at Providence, R. I., that the Herreshoff Manufacturing Company has entered into arrangements to build hulls for fast motor boats to be fitted with engines supplied by a New York importer. It is a nephew of the Herreshoffs, Charles Herreshoff, a boat designer engaged in business in New York, who is to build the hulls.

The automobile plant of the Buckeye Manufacturing Company, now in Union City, Ind., is to be removed to Anderson, Ind., and installed in the new factory buildings which have been under construction for the company for more than a year and are now completed. One of the buildings is 200 feet wide and more than 400 feet long.

An automobile passenger service across the island of Porto Rico, from Ponce to San Juan has been established by C. H. Martin, connected with the Knox Automobile Company, of Springfield, Mass., who has secured a franchise or license from the Porto Rican authorities. Connection is to be made with the steamers from the United States, and the government mail carried.

According to the report submitted by the State Road Commission, New Jersey leads all the States of the Union in the matter of improved roads. During the present year $250,000 has been spent by the State and more than twice that amount by the counties for good roads. Petitions for more than 500 miles of new roads are waiting the approval of the road commissioner.

An express wagon driven by a drunken driver collided with Col. A. A. Pope's private automobile recently while it was standing in front of the Exchange Building in Boston, and threw the two occupants of the car to the street and did much damage to the machine. The driver continued on his reckless way and ran into the rear end of a street car, after which he was arrested.

A two-story building with 12,800 feet floor space and a room 50 by 50 suitable for a repair shop, has been secured on West 41st Street, New York, by the New York Garage Company. It is to be made one of the most complete automobile stations in the metropolis, and will incorporate some new ideas obtained by manager E. B. Galliher while in Paris attending the French show.

A Washington Heights branch garage has been opened by the Broadway Garage Company at 413 W. 150th Street, New York, between Convent and St. Nicholas avenues. This is the only storage and repair station in the large residential section "on the hill," and will undoubtedly be welcomed by the numerous owners of cars who live on the Heights and by the large number of motorists who drive through Washington Heights to Lafayette Boulevard, Washington Bridge and Kingsbridge.

One of the largest automobile stations in central Ohio will be opened January 1 at 753–755 East Long Street, Columbus, O., by William M. Frisbie, president of the Columbus Motor Vehicle Company. Mr. Frisbie will handle the Santos-Dumont and at the New York show will arrange for the agency for a small car. He will also do a jobbing business in automobile sundries, and expects to secure a stock of these at the show. He will deal under the firm name of the Frisbie Motor Carriage Company.

Woolston & Brew, an engineering firm for the past five years located at 39 Cortlandt Street, New York, with offices in Philadelphia and Boston, have lately secured the metropolitan agency for the Thomas, and Stevens-Duryea cars, and are now equipping a salesroom and garage at 152 West 56th Street and will devote themselves exclusively to the automobile business in the future. The building in which the new agency is located is well suited to the requirements of the firm, and the changes in the interior arrangements now being made will be completed prior to the New York automobile show.

The members of the firm are George F. Woolston, Lee W Woolston and William P. Brew. George F. Woolston has just returned from a trip to the different automobile centers and spent ten days in the shops of the E. R Thomas Motor Co., Buffalo, studying the new three cylinder Thomas car. The Woolston & Brew repair shop is in charge of A. M. Hudson, formerly in the employ of H. S. Harkness, an amateur designer and builder of gasoline racing machines.